The Only Journal With a Paid Circulation in the Rock Products Industry

Rock Products

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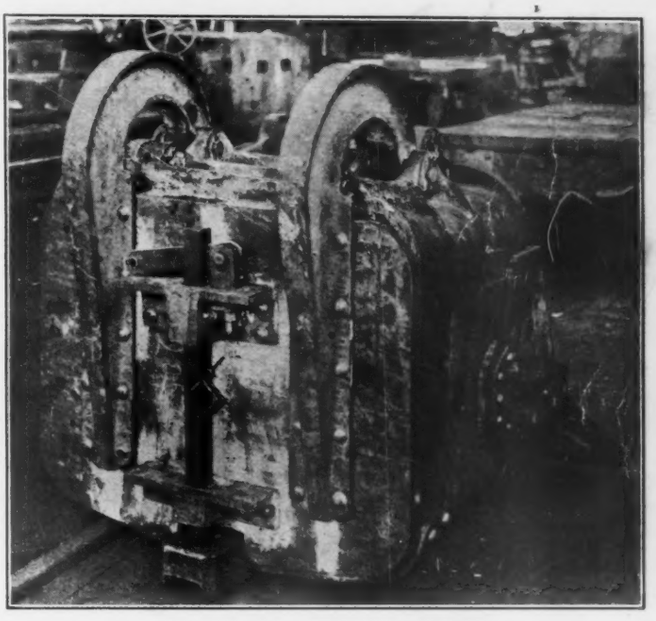

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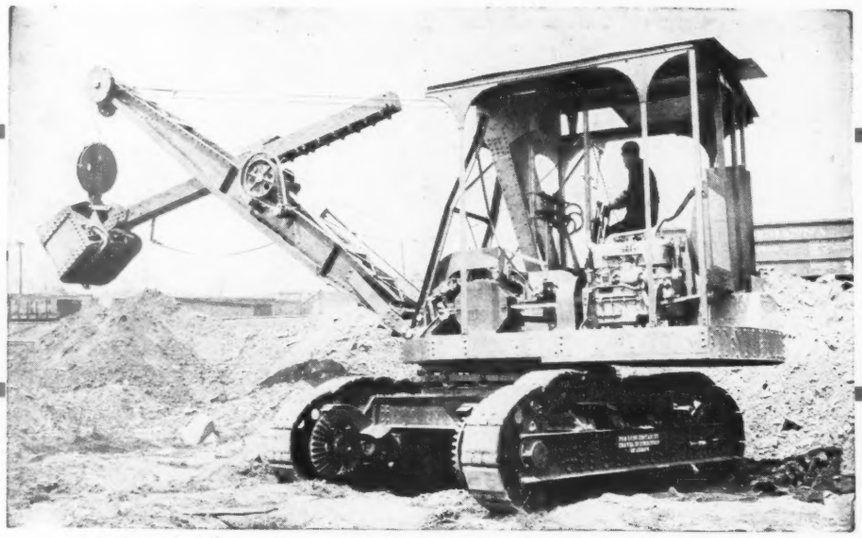

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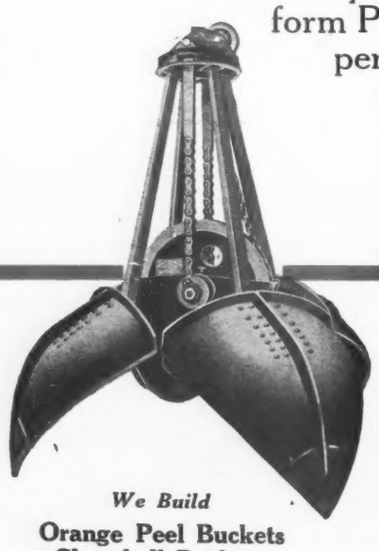

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Rock Products

Volume XXVII Chicago, January 12, 1924 Number 1

American Crushed Rock Co.'s Plant

Outstanding Among 1923 Plants for Its Excellent Design as Well as for the Speed with Which It Was Constructed and Remarkable Safety Record

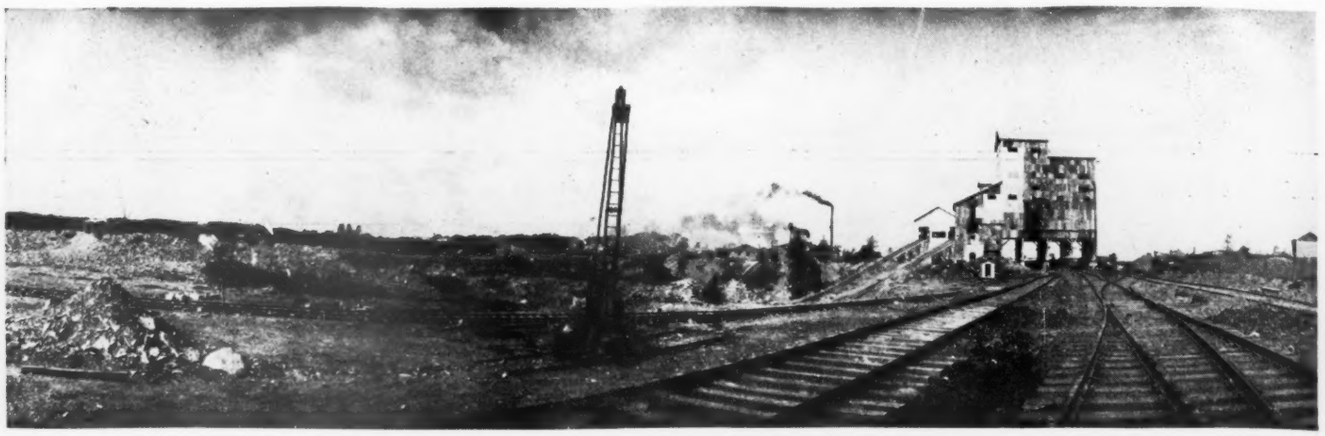
AN outstanding crushed stone plant among those built in 1923 is the plant at White Sulphur, Ohio, of The American Crushed Rock Co. of Cleveland. This is not on account of its size, for while it produces 3000 tons daily, this cannot be considered a large production now that 4000-ton and 6000-ton plants are becoming fairly common. There are no strikingly unusual features in the layout. But everything about the plant shows the care and thought that has gone into the design and construction, with plenty of room everywhere for the men to move about and between the machines, with solid, ample foundations for everything and the best of materials used.

This care and thought is reflected in the steady production which the plant has maintained from the first and especially in the remarkable safety record that has been made. At present 140 men are employed about the quarry and crushing plant, for there is a considerable amount of construction still going on, and during last summer as many as 275 men were employed. But up to date there has not only been no serious accident; not a man has received an injury that required more than slight medical attention, a safey record of which A. Bushman, the superintendent, has good reason to be proud.

The quarry, an old one, has long supplied the lime plant which the company still operates. But it was worked on a small scale, and the only crushing plant was a small affair that stood near the lime kiln. Dismantling this crushing plant was begun about the middle of last April. During the

View of the quarry taken from the top of the incline by which the primary crusher is fed

The primary crushing plant is at the left, the re-crushing plant in the center, and the lime plant at the extreme right of this picture



Panorama of quarry and plant. The face shown here is about 1000 ft. long and will be carried out 2000 ft. farther as the work proceeds

summer the new plant was erected and by the latter part of October it was in full production. The time actually occupied in construction was a little less than six months, which makes another excellent record for a plant of this size.

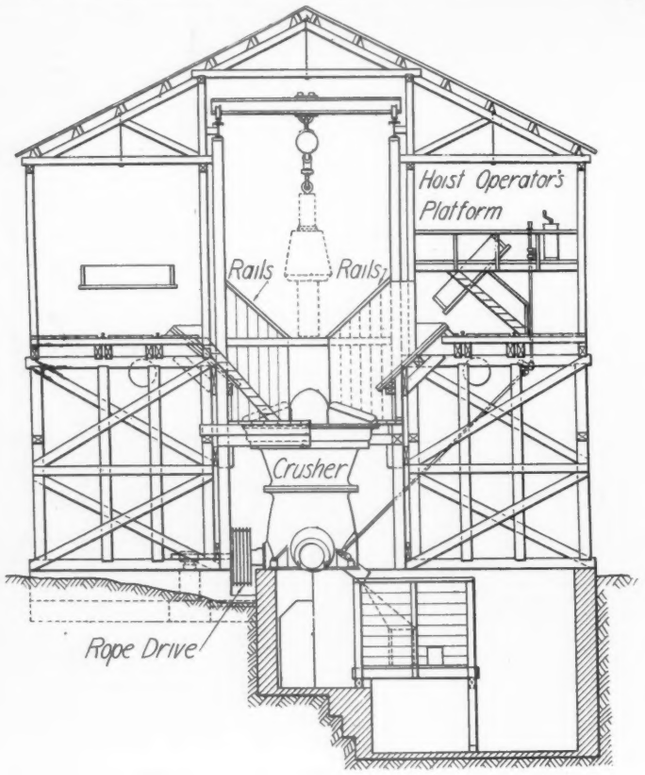
The crushing machinery is in two buildings, the first of which is the primary crushing plant housing only the No. 18 McCully gyratory crusher and the equipment necessary to bring it the stone from the quarry. A 36-in. belt conveyor connects the primary crusher to the recrushing plant, where the rock is crushed into commercial sizes and railroad ballast.

Broken rock in the quarry is loaded into 6-yd. Koppel cars by either a 95-ton Bucyrus shovel with a 5-yd. bucket, or a 70-ton shovel of the same make with a 3-yd. bucket.

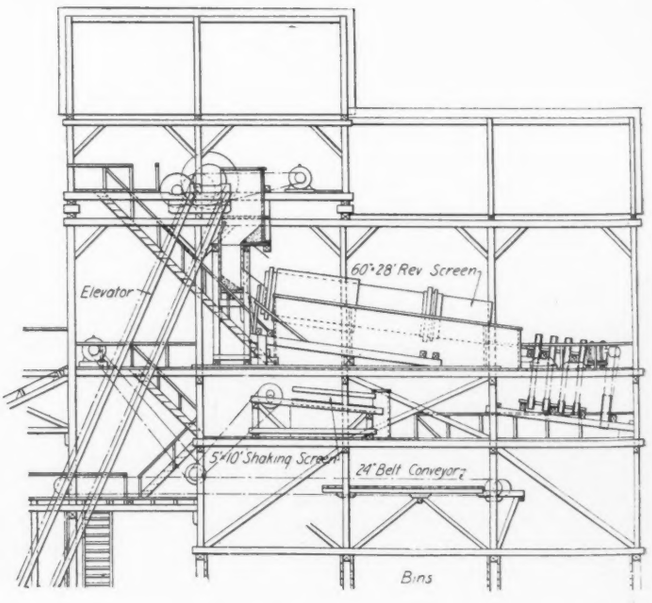
Locomotive crane and 12-yd. car stockpiling

These cars are pulled by a Thomas electric hoist up a double incline, the cars being in balance. The cars are dumped by hand into a hopper and fall into the gyratory crusher and to a bin from which the belt conveyor is fed.

The big gyratory is so well installed and set on so solid a foundation that it is almost impossible to tell whether it is running or not when one stands beside the base on the lower floor. A 6-yd. car of rock runs through it in about the same time that a pound of coffee would run through an electric coffee mill, and with rather less noise and fuss than the coffee mill would make. It will take pieces up to 36 in., and about the only time that the feeder has anything to do is when a piece that is larger than this comes along. With a big piece the

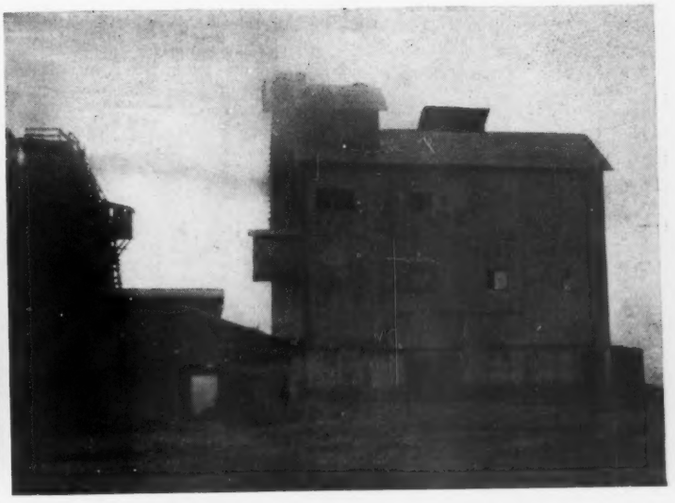


Section through the primary crusher house



Section through the upper part of recrushing plant, showing one of the four revolving screens and the shaking screens below. Screened products fall directly to bins underneath

The lime plant which has been serving a number of years and which is to be remodeled

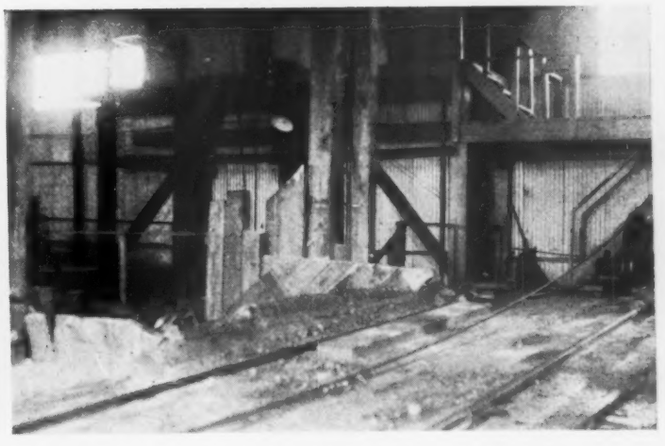


The hydrating plant run in connection with the lime kiln shown on the left

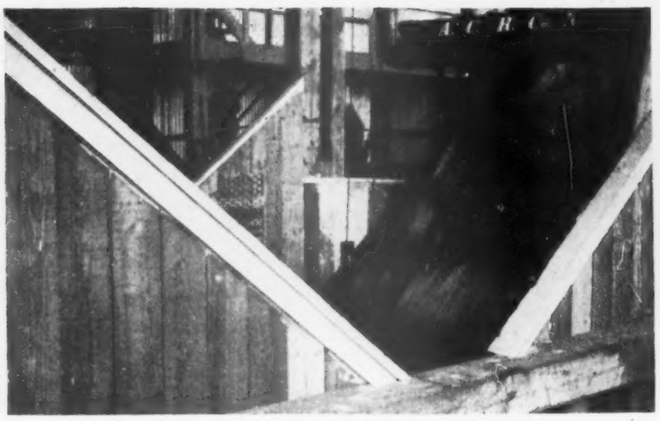
One of the 3-yd. shovels beginning a stripping cut on ground above the quarry

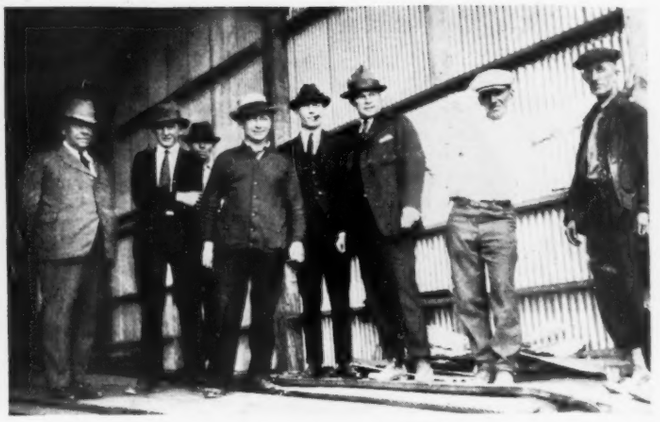
Where cars enter the primary crushing plant at top of the incline

The relation of the two plants with the incline to the primary crusher in front and the belt conveyor to recrushing plant shown behind it



Inside, at the top of incline. The cars dump into the hopper at left. The hoist man sits in the closed-in space above, to which the stairs lead





Left, one of the 6-yd. cars dumping to the big crusher. Right: D. S. Brewster, Trojan Powder Co.; C. Owens, Clerk; B. Tracy, yard master; J. Paulus, electrician; H. B. Shoodis, Trojan Powder Co.; C. B. Moon, vice-president American Crushed Rock Co.; A. Bushman, superintendent and C. Chamberlain

5-ton Curtis air hoist, that is shown in one of the pictures, has to be brought into service to turn and manipulate the rock while it is being sledged to feeding size.

A 15-ton traveling crane loads and unloads coal and stone in the storage yard.

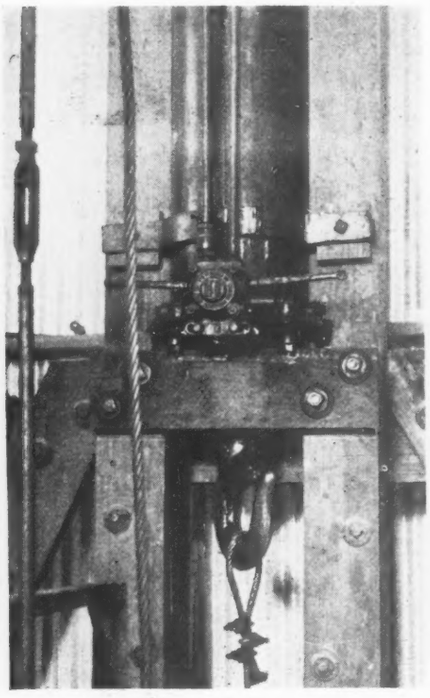
The 36-in. conveyor belt which connects the two plants is 8-ply and rubber surfaced, of Goodyear make. It is set at 23 deg., which is an unusually steep inclination, but the stone does not roll off. Where the belt discharges in the recrushing plant, there is a clever scheme for removing the dust made in the primary crushing. This dust is in the lower part of the stream that falls from the belt and it is cut off by means of a sliding plate and sent at once to the dust bin.

The grizzly which receives the belt discharge is of railroad rails set 5 in. apart. The oversize goes to two No. 7½ Allis-Chalmers gyratory crushers and the undersize to two large Webster steel elevators with 14x 30-in. buckets. These buckets are carried with a series of links and pins which run on small idler wheels. Although these elevators are of more than 70-ft. centers, they run very smoothly and do not give the slightest trouble. After passing the 7½-in. crushers the oversize of the grizzly goes to these same elevators.

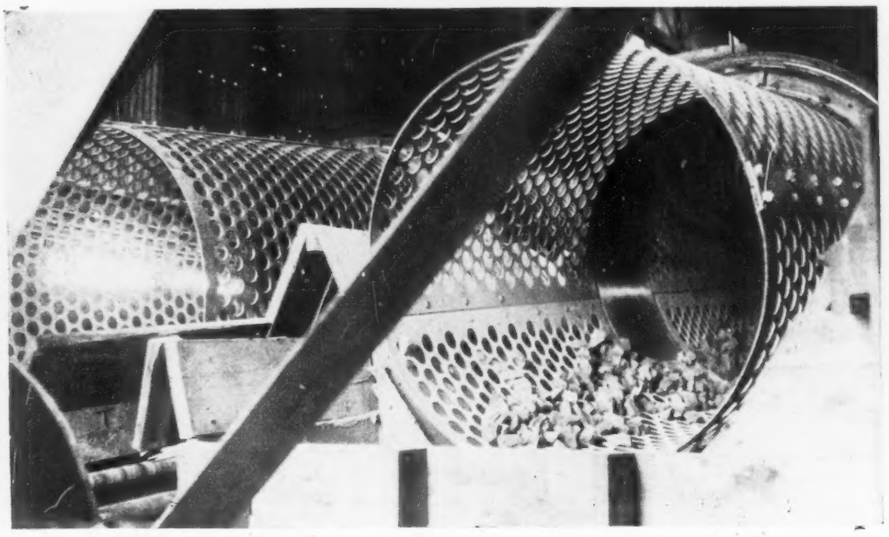
Base of primary crusher

The elevators discharge into a hopper which feeds four revolving screens. These are of a type not often found in stone crushing plants, for they are made by the Greenville Manufacturing Co. and are of the same type that this concern puts in its gravel plants. There are four sections to each screen. The first and second have 2½-in. perforations the third 2¾-in. perforations and the fourth 3-in. perforations. The dust jacket at present is of 1-in. wire mesh, but it is to be changed to 1¼-in. round holes. It takes all that goes through the first section and a part of what goes through the second section.

Directly underneath the revolving screens are four Allis-Chalmers shaking screens that take what passes through the dust jacket. These are double deck screens, the upper deck being covered with ¾-in. mesh and the lower with ⅜-in. mesh, so that there are three products made, a 1-in. and a ⅝-in. commercial stone, and dust, that which passes the ⅜-in. screen. The 1-in.



Five-ton air hoist used to handle large rocks at the crusher



There are four of these revolving screens of a type more often found in gravel than in crushed stone plants

stone is sometimes sold as such and sometimes mixed with the product of the coarser screens to make railway ballast. The undersize of the third and fourth sections of the revolving screens is treated in the same way, so that the plant at various times produced five sizes of commercial stone and railway ballast. A considerable part of the production is in railway ballast.

All the screen products fall into the bins through chutes, which are arranged to switch and mix the different products as desired. There are nine bins, each 17x16-ft. and 17-ft. deep, and they are arranged *en bloc*, three each way. They are of timber, lined with 2-in. and 3-in. planking and set the full 21 ft. above the track so that a man may stand erect on a box car and not be hurt. The same idea of safety first is found in the bin gates, which are large enough to allow a man's body to pass through easily.

The dust, along with the quarry strippings, is sold to help in making the big fill which the Big Four railroad is constructing near Delaware to cut off a big loop in the line. The other products find a ready market with the railways and the many large industrial towns and cities which are found in that busy part of Ohio.

The quarry practice at this plant is interesting. The rock has first to be stripped, the depth of stripping being from 2 to 22 ft. There is a 30-ft. face and holes are put down by five well drills of the Loomis and Sanderson-Cyclone make. Two of these machines are gasoline driven and the rest are electric powered. All use a 5⅝-in. bit, and holes are drilled 2 ft. below the quarry floor. Three or more rows of holes are put down, the first being 18 ft. from the face and the second row 6 ft. behind the first. The holes are 12 ft. apart in the rows. An average shot brings down about 15,000 yd.

About 70 lb. of powder are used to a hole, all of it being placed in the bottom, in 5x17-in. cartridges. They are fired by Cordeau-Bickford plain fuse. The success of this system of shooting is shown by the fact that the broken rock is thrown clear to the track and it is so well fragmented that not more than 2 per cent of the rock has to be broken by secondary shooting. What little drilling needs to be done for secondary shooting is done by Ingersoll-Rand Jackhamers.

The stripping is done by two 60-ton Marion steam shovels, both of which have 3-yd. buckets. For pulling the loaded cars to the foot of the incline two American, 25-ton locomotives are used and a third, which is used in the yard, 30 tons.

The quarry is now opened about 1000 ft. from the plant incline and is not much less in width at the widest part. It is planned to carry on the work for 2000 ft. in the same direction at once, so as to give two faces each 3000 ft. long. Later the quarry floor will be lowered.

The lime plant is at present supplied with stone which is hand loaded at the quarry and then sent up on an incline. But this is only a temporary arrangement and it is to be changed by the construction of a short track which will bring in a part of the oversize of the grizzly in the recrushing plant. The lime plant, as was said at the beginning, is an old plant, built of stone and of a type now rapidly becoming obsolete. It is to be brought up to date, or a little beyond, for Mr. Bushman says that as soon as the contemplated improvements are made it will be a "full 1926 model."

A hydrating plant is connected with the lime plant and produces from 40 to 50 tons of hydrate per day. A pot crusher and a Clyde hydrator are employed.

The main offices of the American Crushed Rock Co. are in Cleveland. A. S. Hecker is president, C. B. Moon is vice-president and C. A. Wood is secretary and treasurer. White Sulphur, where the plant is located, is just half way between Marion and Columbus, the nearest large town being Delaware, which is seven miles away. It is a small station on what is locally known as the Short Line, connecting Delaware and Springfield. Ostrander, Ohio, is the nearest postoffice. The J. C. Buckbee Co. did the engineering work for the plant.

Illinois Geological Survey Completes Study of Road Building Materials

THE Illinois State Geological Survey located at Urbana, Illinois, has just made a reconnaissance survey of the gravel and limestone deposits of the state to determine the location of desirable pits and quarries easily accessible to the railroads.

The locations of the sand and gravel deposits of Illinois bear a close relationship to certain glacial geological features. There are two general types of locations of existing sand and gravel pits, the first, outwash deposits on the outer slopes, i. e., south or west, of terminal moraines, and second, valley train deposits along valleys leading out from terminal moraines. To the first class belong most of the developed deposits of McHenry, Kane and Western Bureau counties. To the second class belong typically the Will, Winnebago, Ogle, Whiteside, La Salle, Putnam, Marshall, Woodford, Peoria, Schuyler, Tazewell and Logan county pits and those along the Wabash river and some in Kane and Kendall counties. In addition to these is a special third type, the hill or kame type, such as those in Bond and Fayette counties. New undeveloped deposits are logically to be looked for in similar situations, and field work indicates that most of such deposits are found in just such situations with reference to the terminal moraines.

The total production of sand and gravel in 1922 was 8,840,293 tons, valued at $5,411,821, representing an increase over the previous year of approximately 36 and 10 per cent in production and value, respectively.

The most important limestone formations of the state are found in the older geologic formations, mostly in the Silurian and Mississippian systems, although some limestone is also obtained from the Ordovician, Devonian, and Pennsylvanian. The formations in Illinois have been altered from their original horizontal position, and now form a broad spoon-shaped shallow basin in such fashion that the older, thicker limestone comes to the surface along the southern, western and northern margins of the state. The great dearth of commercially workable deposits of limestone over the interior two-thirds of the state is due partly to the fact that that portion is so heavily covered with drift that limestone which otherwise might be quarried is not accessible; and partly to the fact that the Pennsylvanian strata which underlie the drift over the broad central basin consist mainly of sandstones and shales.

In 1921 the total production of limestone was 4,256,580 tons valued at $4,298,402, of which almost one-half represented the quantity used for cement, much of which is used for road making. Other uses in decreasing order of their importance are for railroad ballast, flux, riprap, agricultural lime, rubble, building stone, sugar factories and whiting. The value of the production in 1921 was almost equal to that of the previous banner year, in which the total value amounted to $5,623,400.

The policies of the Illinois Geological Survey have been shaped not only with the duty of investigating fundamental problems of geology, but also to make application of the results of such geologic and topographic work to the development and conservation of the resources of the state. The Survey maintains a bureau of information in response to the many and varied requests for data regarding the mineral resources of the state.

F. W. DeWolf, chief of the Illinois Geological Survey for the past 14 years, resigned recently to become the chief geologist of the Humphreys Oil Co. in Texas, and Morris M. Leighton, formerly of the University of Illinois, has been appointed his successor. A list of publications describing the reports published by the Survey and other available information of a special sort can be obtained by addressing M. M. Leighton, Chief, State Geological Survey Division, Urbana, Illinois.

Financing to Increase Output

How the Pratt Rock and Gravel Company, San Francisco, Raised $200,000 by the Sale of 7 Per Cent Preferred Stock

MEN get into quarry or sand and gravel plant operation from many other lines of business. Some were engineers, some railway men, some lawyers and some are natural born traders or salesmen. Perhaps every type of business training has its advantages to the prospective operator of a quarry or sand plant, but to be a successful operator one must at one time or another show a variety of business talents hardly exceeded in any other kind of a business enterprise. For to be a good manager is not sufficient, to be a salesman is not sufficient; and to be both does not always fill the bill. The successful operator and business developer must be able at times to sell himself and his whole enterprise (figuratively speaking) to some hard boiled banker, or financier; or see the whole works go to pot, when he really has a meritorious proposition. Or he may see the finest opportunity in the world to expand his operations and make them successful and be unable to raise the necessary capital to put his ideas into being.

It is very difficult to interest a banking institution in a sand or stone proposition. They are generally financed with the private funds of the promoters, or on their personal credit. There are many reasons for this, probably the principal one being a lack of appreciation on the part of the layman of the real basic, important character of the industry. Possibly another reason is that nearly all such operations are privately owned enterprises and few facts and statistics in connection with their earnings are available. If more stock in them was owned by the public possibly bankers would have greater respect for them.

Be that as it may, ROCK PRODUCTS has seldom had the opportunity of telling how a bonafide operation of this kind has been financed by a reputable producer in a legitimate way. In this case the operator is an ex-advertising man. He has a successful record as a sand producer. He is a West Coast man thoroughly embued with West Coast enthusiasm and methods and habits of doing business. And in these, frankness and open-handed policy are leaders. He is Clarence F. Pratt, president and manager of the Pratt Building Material Co., San Francisco, Calif.

To begin with, as a thoroughly experienced advertising expert, Mr. Pratt has always made advertising an important part of his business. His "copy" appearing in

Clarence F. Pratt

This is "Sandy"

Part of the 158 acres of boulders left by California gold dredges at Folsom, Calif., in which Mr. Pratt saw a fortune

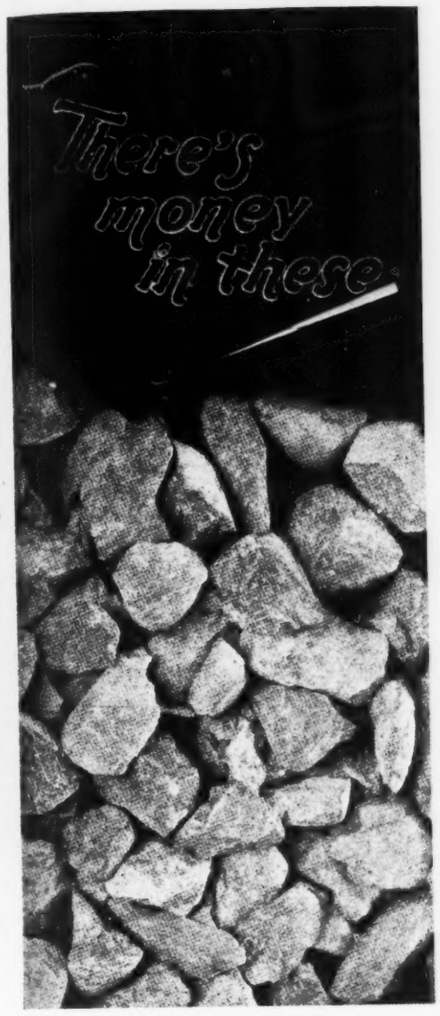


Photo of prospectus booklet — actual size 3⅞x9 in. — printed in orange and black

the *Daily Pacific Builder* and daily Sacramento *Bee* has long been his especial pride. These ads run in the *Builder* every Tuesday and Thursday, and in the *Bee* on Saturdays. He says: "There is a new story every time, and good or bad as they may be, they are read. The Sacramento *Bee* has a circulation of 40,000 and from letters and comments it appears that a good many thousand people read this near comedy."

How successful this advertising has been in actually getting orders for sand (that's all he produces now) we do not know, but it has accomplished one of the big purposes of *all advertising* and that is to create an enormous amount of good will for Mr. Pratt and his enterprise. It has made him and his enterprise public characters and inspired confidence in him and his business ability in a large way, as perhaps nothing else would have done. "I feel that these stories," said he, "have laid the foundation for the sale of the $200,000 worth of stock in my new concern, the Pratt Rock and Gravel Co.;" and we are sure that no one can deny the truth of what he says.

He conducted his sale of preferred stock both through advertisements in his regular channels of publicity and by circular. A unique post card in orange and black—his color scheme—is illustrated herewith. The booklet, being a very unique prospectus from several points of view, we reprint entire. Here it is:

If you get a copy of this booklet the chances are that you are a friend of mine, because I am selling the stock in this new company to people that I know or do business with practically every day. With the aid of an advertising man who is helping me present my proposition and my associates I am selling the stock myself.

So in this booklet I am going to get right down to cases and tell you just why I started this company, how I expect to run it and why I am so certain that it will make big profits that I am asking my friends to put their money into it. After you have read the whole story I expect you to fill out the stock subscription blank in the back of the book and mail it in to me just as quick as the mails will bring it. Personally I can't see any way under the sun for this company to fail to make big profits and I honestly and sincerely believe that I am giving you a real opportunity in asking you in.

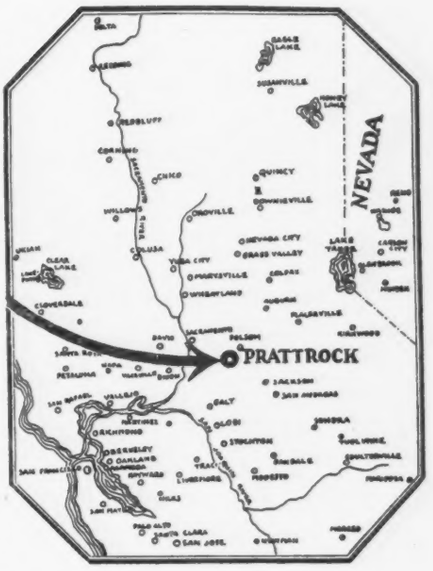
I'll be perfectly frank, too, and tell you that if I had the money to finance the whole thing myself I probably wouldn't be selling any stock to you or anyone else unless I wanted to make you a present. That's just how good it is. But let me tell the whole story and then you will see for yourself.

How It Started

Ten years ago I went into the sand business. I believed that I could make money selling such a stable commodity as sand. No matter whether there is a building boom on or not, there is always a big demand for sand and if a fellow is on the job all of the time and supplies his customers with a good quality of sand, promptly and at a decent price, he can build up a nice business. That is what I believed. And it worked out.

Understand now, I am not boasting, I am just talking about myself in a frank sort of way as if I were you and were telling some friend of ours about what you had done.

I have done a lot of advertising. My business has grown and now if there is anyone connected with the building industry in any capacity in northern California who doesn't know Sandy Pratt and his sand, I want to buy that gentleman a lunch at the Palace hotel and make his acquaintance. That's an invitation.



Map accompanying prospectus

There's Money in It

Soon after I started my little one man sand business I found that I needed more capital. So I incorporated and sold some stock, just as I am doing again now. It was sold at $1 a share. A short time later some of it was resold at $1.88, then at $3, then at $5, and a couple of years later at $10. Now you'd have to pay $15 and you would be making a good investment at that. We pay monthly dividends.

Not so bad for just a sand business in ten years, is it?

Now for Rock

All during these years that I have been selling sand we have been doing a small amount of crushed rock business. The two go naturally together. Almost every job that takes sand takes rock. So some years we have sold hundreds of cars of rock and WE HAVE HAD TO BUY IT.

How we have wished that we had our own rock supply as we have our own three big sand pits!

Dear Sandy:

You can send me your booklet about your new rock company and I'll look it over. If it looks good to me I may invest a little with you. But, understand this doesn't obligate me at all.

Name _____

Address _____

Return post-card request for prospectus

But I have had to be content with my sand business and lose most of the orders for rock that were offered me.

Then This Happened!

One day I got wind of a most unheard of opportunity. Someone told me that up along the American river near Folsom, where the gold dredgers have been at work for many, many years, there was a quarter section (158 acres) of boulders left by the dredgers and for sale! The Southern Pacific railroad runs around three sides of the property. The Tahoe-Placerville highway follows it for three-fourths of a mile.

Say! I could hardly sleep or eat until I found out if that were really so. Scores of times I had driven by those great fields of boulders and thought what a rich fortune the dredgers had left in them. Millions of dollars in the clean, round boulders that they had heaped up!

Here was material for thousands of buildings. Already one big company was running a plant to crush them and was sending out trainloads almost daily to all parts of northern and central California. Just the kind of rock for building construction, highway and railroad purposes.

It did not seem possible that anyone had overlooked the chance to pick up such a precious supply.

But it's the old story. Everyone thought that someone else had certainly taken it—just as I thought—and so no one had bothered to investigate.

What I Did Then

When I learned the truth I bought an option on the land so quick that the boulders almost turned around to look at me. Then I sat down to see how I would handle them.

It was out of the question for me with my few thousands of dollars to finance as big a proposition as was needed. Although I had made good money I did not have $200,000 loose and that, I found, was just about what it would take.

So then I said: "Sandy, here's an opportunity. Organize a company among the people that you do business with now. You sell them sand, sell them an interest in your rock business and make all of your CUSTOMERS your PARTNERS."

Simple, isn't it? And yet, I'm proud of myself for thinking of it. Right away it simplifies the problem of selling the rock—if there is any problem to that with the demand increasing every day.

So that is the way it started and that is why I am asking you to put some of the money that you might use in your own business, or that you have in a savings bank or that you are now earning, into a business that I believe will pay you big dividends.

Now Let's Figure

You have the history of the proposition. Now let's get down to brass tacks and see what it all amounts to.

We are incorporated for $400,000 capital. There are 2000 shares of 7 per cent cumulative preferred stock and 2000 shares of common stock. With every share of preferred stock you buy, you get one-half share ($50 worth) of common stock free. In other words, the people who put up the money get all of the profits up to 7 per cent on their investment, then I split with them 50-50. That's a fair proposition, isn't it?

I make my money after you get yours at a better rate than most stocks pay and then you get just as much more as I do. So that answers the first question you will ask, which is, "Where do you come in, Sandy?"

But That Is the Least of It

Where I come in isn't nearly as important as where WE BOTH COME IN. And here's the answer to that: We will use the $200,000 to pay for the land, to erect the most modern type of rock crushing and screening plant in California, to construct railway lines over the property, to equip the plant and the road with steam shovel, locomotives, cars and tools, to build the necessary buildings and to provide a safe amount of working capital. It takes $200,000 to do that. The details of just what the money will be spent for are all set forth in the report of the engineer employed to make the plans for the plant, which report is available for your study if you want to look it

As soon as we have a few thousand dollars worth of stock sold—and when this booklet goes to press we will already have nearly enough sold for that—we will build the first unit of our plant to start producing right away.

Now Here Are Figures

All of the rock on these 158 acres—there are only 10 acres of land not covered—is easily seen

WE ARE all down.
AT CAPITOLA-By-The-Sea.
HAVING SOME fun.
AND HELPING to judge.
THE BATHING Girls' Revue.
AND EVERYTHING.
AND CLARENCE Sand Pratt, President.
OF THE Pratt Building Material Co.
DOUGLAS 300—"easy to remember."
WILL NOT talk business.
UNLESS, OF course.
YOU NEED a carload.
OF CLEAN, sharp sand.
AND MY folks say
DON'T START Clarence.
TO TALKING.
ABOUT HIS new rock company.
(THE PRATT Rock & Gravel Co.
FOR SANDY never knows.
WHEN TO stop.
SANDY SEES a fortune.
IN THE crushing.
OF THE cobbles at Prattrock.
ON THE Tahoe-Placerville Highway.
NEAR FOLSOM, Sacramento County.
AND SANDY Pratt is asking.
HIS FRIENDS to share.
SOME OF his good fortune.
SANDY GAVE a carload.
OF CLEAN, sharp sand.
AND ANOTHER large carload.
OF CLEAN, hard rock.
AS PRIZES for "Builders' Day."
BUT IN the contest.
FOR A good trade name.
FOR SANDY'S new crushed rock.
YOU CAN win $100.00 worth.
OF PREFERRED stock.
OR $50.00 worth.
OF COMMON stock.
BOTH OF which are sure.
TO INCREASE in value
IN A short time.
SOME OF Sandy's best friends
AND CUSTOMERS, too.
ARE BECOMING stockholders.
AND LATER will be dividend receivers.
BUT SANDY is so busy
TRYING TO have a good time.
AND HELPING.
THE OTHER fellow enjoy himself.
THAT SANDY has forgotten.
ALL ABOUT the new rock company.
AND ITS wonderful product
PRATT'S CLEAN, hard rock.
"I THANK you."

Mr. N. O. Stockholder in Sandy Pratt's new crushed rock company, the Pratt Rock & Gravel Co. This man, Mr. Poor Judgment, and his sad family now see their terrible mistake, for Clarence Sand Pratt, President of the new company, at great length and with a flow of oratory that Julius Caesar would have been proud of, told this now sad man of the wonderful prospects and profits of the new company that Sandy Pratt is going to operate in conjunction with his three sand pits. These folks cried so hard that the tears ran down the stairs and drowned a baby, two parrots and a cat in the flat below.

A sample of Sandy Pratt's advertising which included stock-selling features

IN LAST Sunday's Examiner
IN THE automobile section.
WAS A photograph.
OF A sign erected.
AT THE Sacramento sand pit.
BY CLARENCE Sand Pratt, President
OF THE Pratt Building Material Co.
DOUGLAS 300--"easy to remember."
THE SIGN has attracted.
THE ATTENTION of thousands.
AND IS located.
ON THE state highway.
ONE MILE from the capitol.
AND NEAR the American River.
WHERE SANDY Pratt.
PRODUCES THE best sand.
FOR PLASTERING and brick work.
IN THE entire world.
THE SIGN says.
"PRATT'S SAND Lane.
SPEED LIMIT 99 miles.
PER HOUR.
FORDS DO your best."
ALSO AT Prattco, Monterey County.
THERE IS a similar sign.
ON THE Santa Cruz.
AND WATSONVILLE highway.
WHICH READS.

"PRATTCO.
SPEED LIMIT 99 miles.
PER HOUR.
FORDS DO your best."
AND THESE signs.
MUST BE all right.
WHEN THE Sunday Examiner.
WITH OVER 300,000 circulation
SEES FIT.
TO RUN a three column cut.
OF THE same.
WITH A story under it.
"I THANK you."

Sandy Pratt, President of the Pratt Building Material Co., has the best sand for concrete, plastering, brick work, sandblasting and locomotives and Sandy wants the world to know it. When the Pratt Rock & Gravel Co. starts its $250,000 rock and gravel crushing plant at Prattrock (near Folsom) Sandy will tell the world about the best rock and gravel.

A sample of Pratt advertising. He says that letters show that thousands of people read what he calls "this near-comedy" weekly

and measured. We know just the character of it and how much there is. Engineers tell us that there are 6,000,000 tons—that's 120,000 carloads at 50 tons to the car. If we sell 5000 cars a year—that's a supply good for 24 years. If we make $20 a car—that's a total profit of $2,400,000!

But let's back up a minute and sell it a year at a time. Just one year, we'll say, at only 3000 cars. (One concern placed an order the other day for 1500 cars.) Suppose we sell 3000 cars a year, which our plant will allow us to do at an estimated profit of $20 a car, here is how we'll figure earnings:

3000 cars at $20 means $60,000 profit a year.

We pay 7 per cent on the preferred stock; that's 7 per cent of $200,000, which equals $14,000.

Then we will have available for dividends on the common stock and for surplus $46,000, or 23 per cent, for each share of common stock.

Now, remember, for each share of preferred stock that you buy you get one-half share of common stock free, so if you invest $100, you buy one share of preferred and get free one-half share of common, and you get $7 dividends on your preferred and there will be available for dividends and surplus $11.50 per share on your common stock, or a total of $18.50 per year on each $100 invested; 18½ per cent!

Not So Bad, Is It?

But that is on only 3000 cars a year. We can handle 5000, for our plant will have a capacity of 500 cars a month.

Figuring out the profits in the same way as above on 5000 cars, there will be available for dividends and surplus 28½ per cent. Isn't that worth sacrificing a little to invest for? I believe it is. I believe that as I said at the beginning of this booklet, I am perfectly safe and sincere in asking my customers and other friends to put their money in.

More Good Features

The company will start doing business at a profit right from the jump. My present company, the Pratt Building Material Co., will be the selling organization, and believe me we will sell all the rock that you can produce.

Most companies have the problem of organizing a selling force and opening up credit accounts and all the rest of the details that cost time and money. This company will have the advantage of our entire selling force covering all northern and central California. We will handle all details of the orders.

All the new company will have to do is crack up the rocks and hand them out to us.

Another big feature in any business of this nature is the traffic department—arranging for empty railroad cars, routing shipments, securing prompt movement of carloads. Our new company will not have these worries, for the Pratt Building Materials Co. is already experienced and well organized to take care of all traffic matters.

Our location is a tremendous asset to us. With the Southern Pacific running right alongside rock because the owner will not sell his land outright, and this royalty runs from 10 cents a ton up. Think what a saving that means on our total of 6,000,000 tons.

After the rock is removed, we still have our land, which will be readily saleable.

That's the Story

Now how does it sound to you? Do you blame me for being enthusiastic? I have tried to tell the whole story in plain, simple language without any of the usual guff that accompanies a stock selling proposition. I have told it in the same way to many men personally and dozens of them have bought stock without half the details I have given to you. Not easy marks, either, but men who are in the building material or construction business and who know how much money a modern rock crushing plant can make.

They know that the demand for rock is increasing every year. More and more concrete is being used—and that calls for rock. Railroads are being improved and that calls for rock—millions of tons of it! Highways are being extended and made wider and thicker—that means more millions of tons of rock. And bridges, dams, power houses—all eating up so much rock that the question is not how to sell it, but where to get it!

our property, our shipping cost is cut away down. We'll have our own spur tracks. Right near us, too, runs the Placerville-Tahoe highway, which enables us to take care of a big truck trade.

Another feature that insures low cost and consequently big profits is the fact that we OWN our land. Many rock companies pay a royalty for

These business men who have invested know, too, that with this rock crushed in a plant that uses all the modern devices of steam shovel, electricity and railroad, the cost can be cut way below that of the old-fashioned methods.

Our engineer's report proves that. We have the figures to prove that a profit of $20 per car can be made.

These men are going to make money out of their investment.

How About You?

After hearing this whole simple, frank story—written as plainly and as forcibly as I can tell it—are you going to lay it down and wait, or are you going to say, "Sandy, that looks good to me. I'll put all the money I can spare to work on it. I don't know where else I can do as well."

The Value of Publicity

Probably many readers will think this reads too much like a wild-cat oil-well promotion proposition; but bear in mind that

this booklet *was not* distributed to the general public; it went to people who knew Mr. Pratt personally and had every opportunity of checking up every statement made. It was designed to impress hard-headed business men, and it did. Mr. Pratt says: "One of my competitors paid me a high compliment by saying that I was just crazy enough to put this deal over."

There were, of course, other pieces of follow-up literature in this stock-selling campaign, including a reprint of half a column on "Business" by Dennis Donohue from the San Francisco *Examiner* entitled "Sandy Pratt to Give Natomas a Run for Money"—an article which grew out of the fact that Sandy Pratt was a public character and this story about his doings had real *news* interest—and don't forget that advertising made him a public character whose name is known everywhere along the West coast.

Details of the Ohio Sand and Gravel Rate Case

An Interstate Commerce Commission Decision of the Utmost Significance to the Industry

THE DECISION of the Interstate Commerce Commission to uphold the Ohio Public Utilities Commission's reduction of freight rates on sand, gravel and crushed stone, was briefly noted in ROCK PRODUCTS of December 29, 1923, page 121. Since then we have received a copy of the decision. The following extracts are of extraordinary interest to every operator in the mineral aggregate industry:

No. 14252.

IN THE MATTER OF INTRASTATE RATES ON SAND, GRAVEL, CRUSHED STONE, AND VITRIFIED PAVING BLOCKS WITHIN THE STATE OF OHIO.

Submitted July 12, 1923. Decided December 3, 1923.

Intrastate rates on sand, gravel, crushed stone, and vitrified paving block required by State authority to be maintained by respondents within the State of Ohio not shown to result in unjust discrimination against interstate commerce or in undue prejudice to persons or localities engaged therein. Proceeding discontinued.

REPORT OF THE COMMISSION.

COX, *Commissioner:*

Exceptions were filed to the report proposed by the examiner and the case was orally argued. Our conclusions differ from those recommended by the examiner.

The issue in this proceeding is whether the intrastate rates in the State of Ohio on sand, gravel and crushed stone, unjustly discriminate against interstate commerce or unduly prejudice persons or localities engaged therein. Rates will be stated in amounts per net ton.

In *Ex parte 74, Increased Rates, 1920,* 58 I. C. C. 220, we authorized an increase of 40 per cent in the interstate freight rates in the eastern group, of which Ohio is a part. Increased rates pursuant thereto were established on August 26, 1920. Following that decision the Public Utilities Commission of Ohio permitted corresponding increases in the freight rates applicable to Ohio intrastate traffic.

By order of July 19, 1921, the Ohio commission initiated an investigation into the reasonableness of the intrastate rates on road-building materials, including sand, gravel and crushed stone. After an extensive hearing, the evidence in which is a part of the record herein, that commission issued an order directing the establishment, on October 20, 1921, of rates for the transportation of the commodities named, in intrastate traffic, as follows:

For sand, gravel and crushed stone: The rates and charges which were in effect on August 25, 1920, with a minimum of fifty (50) cents per ton; That where commodity rates are now published and in effect applying on sand, gravel, crushed stone and vitrified paving block, on either local or joint traffic, which are lower than the rates hereinbefore found and determined to be just and reasonable, such rates shall not be cancelled or affected by this finding.

By supplemental order it was provided that moulding and glass sand should be included in the reductions.

On July 26, 1922, the Supreme Court of Ohio handed down its decision affirming the orders of the State commission.

On September 2, 1922, the steam carriers operating in Ohio filed with us a petition alleging that the rates established in compliance with the orders of the Ohio commission were violative of sections 13 and 15a of the interstate commerce act. We thereupon instituted this investigation upon our own motion. The steam railroads within Ohio were made parties respondent and notice of the investigation was served upon the Governor of Ohio and upon the Ohio commission.

* * * *

The evidence will be considered to determine whether the intrastate rates prescribed by the Ohio commission have resulted in undue prejudice to persons or localities in interstate commerce and whether those rates unjustly discriminate against interstate commerce. In order to answer the latter question it will be necessary, in view of the language of the Supreme Court above quoted, to inquire what is the general level of rates on the commodities under consideration which we have "found to be fair to interstate commerce" in this territory, and whether there is a "substantial disparity" between this level and that of the intrastate rates.

SAND AND GRAVEL AND CRUSHED STONE

The evidence relating to undue prejudice as between particular persons and localities in intrastate commerce, on the one hand, and in interstate commerce, on the other, is conflicting and inconclusive. An exhibit introduced by respondents compares the volume of common sand and gravel moving into Ohio during the period from October 21, 1921, to September 30, 1922, with the movement (partly estimated) during the year 1921, omitting October. During this earlier period approximately 3646 cars moved into Ohio, whereas during the 11-month period immediately following the Ohio commission's order the movement was only 2964 cars. Another exhibit indicates a similar falling off in shipments of crushed stone into Ohio. Respondents draw the conclusion that the reductions in the intrastate rates have enabled the Ohio producers to take business away from those shipping from without the State. A witness who ships gravel from Richmond, Ind., one of the producing points mentioned in respondents' exhibit, testified that the large volume of business in 1921 was due to other causes than the freight rates, including a heavy road-building program in that section, and that the smaller movement in 1922 was partly attributable to inability to secue a sufficient car supply. In the absence of any showing that the falling off in interstate shipments was accompanied by a corresponding increase in intrastate shipments, respondents' exhibits may merely indicate a reduction in the volume of movement in this territory both State and interstate.

A producer of molding sand operating pits in northwestern Pennsylvania testified for respondents that his firm shipped 461 carloads into Ohio in 1921 and in 1922 only 77 caloads. The witness attributed this loss of interstate business largely to competition of Ohio producers under the reduced intrastate rates. He admitted that there was a general decline in the volume of intrastate as well as interstate shipments of molding sand in 1922 as compared with 1921. He did not offer any specific comparisons of interstate and intrastate rates and distances.

An exhibit introduced by the Ohio Sand & Gravel Producers' Association compares the rates from Pleasant Lake, Ind., and Tecumseh, Mich., to points in Ohio for distances ranging from 25 to 100 miles, with average Ohio intrastate rates. To 13 out of 20 destinations the interstate rates are lower than the average State rates for like distances. Respondents contend that in view of the wide range of rates on these commodities a comparison of selected individual interstate rates with average State rates has little value.

In *National Asso. of Sand & Gravel Producers v. P. R. R. Co.,* 74 I. C. C., 615, hereinafter called the *Sand & Gravel case,* the general level of rates on sand and gravel in central territory was under consideration. We there said:

There is a striking lack of uniformity in rates on these commodities in central territory. From exhibits showing rates charged for actual movements in the summer of 1921 it appears, for example, that a rate of 60 cents was applicable for various distances ranging from 5 to 45 miles, and that a rate of $1.12 applied on hauls from 10 to 180 miles in length. For hauls of 65 miles the rates charged ranged from 84 cents to $2.90, the weighted average being $1.20. Obviously, the average earnings on sand and gravel are difficult of ascertainment.

The exhibits referred to in the above quotation were compiled by the defendant carriers in that case from a large number of actual movements over selected lines, both interstate and intrastate. Using these exhibits as a basis, the sand and gravel interests in the present proceeding have constructed a table showing the weighted-average rates in 5-mile blocks for distances up to 100 miles. This table represents the only information afforded by the record as to the general level of rates in

central territory following the increases of August 26, 1920.

On October 21, 1921, upon application of the carriers, we authorized the publication, upon five days' notice, of reduced interstate rates on sand (except silica and molding sand), gravel, and crushed stone throughout central territory on the basis of 115 per cent of the rates in effect August 25, 1920, subject as minima, except between Ohio, on the one hand, and Pennsylvania and West Virginia, on the other, to distance rates prescribed for intrastate traffic in Michigan by order of the Public Utilities Commission of that State of May 13, 1921. The record indicates that this reduction, amounting to approximately 18 per cent, was generally made. Rates which were not so reduced, and all rates on silica and molding sand, received the 10 per cent general reduction of July 1, 1922.

In the *Sand & Gravel case, supra,* decided December 11, 1922, we found that the rates on sand and gravel in central territory, considered as a whole, were not unreasonable.

The intrastate rates resulting from the order of the Ohio commission are shown by respondents in the form of exhibits based on the billing of all shipments moved during the period from October 21, 1921, to September 30, 1922. The total weight moved at each rate is shown, in blocks of 5 miles each. The same lack of uniformity which was found in the interstate rates appears in the intrastate rates. For example, movements of common sand and gravel for 15 miles are shown at 10 different rates, ranging from 50 cents to $1.61. In the 60-mile block 12 rates from 60 cents to $1.40 appear. Often the lowest rate did not move the largest tonnage. The exhibits also show the rates which would have applied on the same movements prior to the reductions ordered by the Ohio commission. From the latter figures the sand and gravel interests obtain the weighted-average intrastate rates on common sand and gravel in effect August 26, 1920, and compare them with their table of average rates in central territory heretofore described. Respondents contend that the comparison should be of the weighted-average intrastate rates in effect subsequent to their reduction with the average rates in central territory reduced 18 per cent. The following table shows these comparisons:

(1)	Ohio rates, Aug. 26, 1920 (2) Cents	Average rates, central territory, Aug. 26, 1920 (3) Cents	Present Ohio rates (4) Cents	Average rates, central, territory, reduced 18 per cent (5) Cents
5 miles	78.8	68.4	56	56.1
10 miles	84.9	76.6	60.5	62.7
15 miles	84.4	82.2	60.5	67.5
20 miles	81.3	76.3	58	62.6
25 miles	92.3	89.8	65.5	73.7
30 miles	97.1	102.3	69	83.9
35 miles	102.3	97.4	73	79.9
40 miles	100.1	110.8	71.5	90.9
45 miles	111.9	85.4	80	70.1
50 miles	114.4	106.6	81.5	87.4
55 miles	110.4	108.1	78.5	89.6
60 miles	111.5	106.8	80	87.6
65 miles	113.4	120	81	98.4
70 miles	124	128.3	88.5	105.2
75 miles	130	119.5	92.5	98.8
80 miles	120.2	112.4	85.5	92.2
85 miles	115.1	143.7	82	117.8
90 miles	132.9	118.4	95	97.1
95 miles	118.3	108.7	85	89.2
100 miles	108.5	133.9	94	109.8

Taking these figures at their face value, they indicate that in 14 out of the 20 mileage blocks the Ohio intrastate rates in effect August 26, 1920, exceeded the average rates in central territory. On the other hand, the intrastate rates as reduced by the Ohio commission's order (column 4) are, in all but one mileage block, lower than the present average rates in central territory as represented by the table prepared by the sand and gravel interests reduced 18 per cent, shown in column 5.

The force of the above comparisons is greatly impaired by the character of columns 3 and 5, which purport to represent the general level of rates in central territory before and after the voluntary reductions of 1921. As stated, the figures in these columns are based on exhibits originally introduced in another proceeding. Those exhibits covered rates on certain lines only, both interstate and intrastate. They showed "a striking lack of uniformity" in the rates, making "difficult of ascertainment" the average earnings on these commodities in central territory. Manifestly the tables constructed from those exhibits do not constitute a complete or satisfactory basis of comparison between interstate and intrastate rate levels.

* * * *

GENERAL

Considerable evidence was introduced on behalf of the Ohio commission and the Ohio shippers in support of their contention that the intrastate rates in effect prior to the Ohio commission's order were higher than the traffic would bear, that the reductions ordered by that commission were necessary in order that business might be stimulated and the traffic move freely, and that thereby respondents' revenues would be increased rather than diminished. This evidence, which included the entire record in the proceedings before the Ohio commission, has been carefully considered.

Respondents introduced exhibits showing the revenue received for the transportation of all intrastate shipments of the commodities in question within the State of Ohio during the period of approximately one year immediately following the date of the Ohio commission's order. This they compare with the revenue which would have accrued if the rates had remained in the *Ex parte 74* level, and on this basis show revenue losses aggregating on the commodities. But the intrastate rates did not remain on the *Ex parte 74* level. They have been reduced in various ways, as previously described, and there is no attempt to show revenue losses based on the present rate adjustment.

CONCLUSIONS

Little attempt was made by respondents to show preference or prejudice as between persons or localities in intrastate commerce, on the one hand, and interstate commerce, on the other hand. It remains to be determined whether the intrastate rates maintained by reason of the Ohio commission's order are on such a substantially lower level than the interstate rates on the same commodities in this territory as to cast an undue burden upon interstate commerce. The law does not require that intrastate rates shall be maintained on the exact level of interstate rates, but only that there shall not exist between the two a disparity so substantial as to operate as a real discrimination against and obstruction of interstate commerce. With revenue discrimination as the principal basis for their contentions, respondents have failed to show with any degree of certainty that there is a substantial disparity between the present levels of intrastate and interstate rates, or that the present intrastate rates do not contribute their proper share of the total revenue.

We find that respondents' intrastate rates on sand, gravel and crushed stone between points in Ohio have not been shown to cause undue or unreasonable advantage, preference, or prejudice as between persons or localities in intrastate commerce, on the one hand, and interstate commerce, on the other hand, or undue, unreasonable, or unjust discrimination against interstate commerce.

An order will be entered discontinuing the proceeding.

Hard Rock vs. Limestone

THE EDITOR—Your answer to question No. 105 (Rock Products, December 15, p. 44). You mention the binding quality of cement to the limestone vs. siliceous rock. I can't understand what you mean by this explanation. You will notice in the same issue an article by Col. H. C. Boyden, giving a different reason for the compressive strength in concrete.

Another point should be taken in consideration, and that is the kind of limestone. As you have observed, there are many kinds of limestone.

Of course, the laboratory always gets the best specimens of limestone. Then the quotient of efficiency of the laboratory in testing as a theory to the practical application of the material. For illustration you have perhaps noticed on the street men and teams plow up this so-called concrete. Did you ever notice the aggregate used and the thickness? There is a difference in uniformity in limestone that you do not find in a hard rock.

This equation between limestone and hard rock as exemplified by different investigators puts me in mind of an old story they used to tell about whiskey, viz.: A good customer one day asked the dispenser why he was boosting a certain brand of poor liquor. His reply was that the good did not need any boosting. My opinion is that your reply to 105 is way off.

I am writing this with no intention of offense in any way and I hope you will not be discouraged; perhaps some day we will find an engineer that does know practical concrete. H. E. Wunder.

Dec. 19, 1923. Presser Junction, Wis.

Editor's Note—Not having a financial interest in either a limestone or hard-rock quarry, we leave to our readers the problem of deciding on the relative merits of the two.—The Editor.

Petoskey Claims Record Production for a Two-Kiln Plant

THE PETOSKEY PORTLAND CEMENT CO. has gone over the top for production in 1923, and will exceed the quota asked by the directors, by at least 10,500 bbl., Secretary Galster has announced.

At the start of the year, the company had hoped for at least 700,000 bbl. The actual production will reach approximately 710,500 bbl. and sales of cement will reach the same figures.

This is said to be a world record of production for a two-kiln plant. The directors have set the figures for 1924 at 750,000 bbl. Work of remodeling the crusher plant to increase the capacity to take care of the demand for commercial rock and to care for the increase in production at the cement plant is now under way.

Will Raise Capacity

When completed, the concern will be in position to furnish all sizes of commercial rock for contractors and builders, road construction, foundries and furnaces, etc.

In 1923 the crusher plant produced about 350,000 tons of crushed rock and the 1924 production is expected to reach 450,000 tons. Next spring, work will start on the enlargement of the cement plant proper, and when completed, the plant is expected to have a production capacity double that at present.—*Grand Rapids Herald.*

Program for the National Sand and Gravel Convention

St. Louis Meeting Will Hear the Most Important Features of Production Discussed by Experienced Operators

The *National Sand and Gravel Bulletin* publishes the following program for the forthcoming Eighth Annual Convention, which is to be held in St. Louis, at Hotel Chase, January 21, 22, 23. The program is as complete as possible, but changes may have to be made before the date of meeting.

MONDAY, JANUARY 21, 12:30 P.M.

Meeting of the Board of Directors at luncheon, Hotel Chase, for the purpose of—

Selection from their own number of four members of the Executive Committee.

Nomination of candidates for the offices of President, Vice-President, and Secretary-Treasurer, and also for three directors-at-large.

Preparation of plan of activities for the Association during the ensuing year and also a budget to cover such activities, for submission to the convention as a whole for approval.

FIRST DAY, TUESDAY, JANUARY 22

Morning Session

9:00 **Registration of members and guests.**

9:45 **Address of welcome by Mayor of St. Louis.**

10:00 **The President's Annual Address.** Alex W. Dann, Keystone Sand & Supply Company, Pittsburgh.

10:15 **Report of the Secretary-Treasurer.** John Prince, Stewart Sand Company, Kansas City.

10:30 **Reports of Committees.** Credentials, Cost Accounting, Car Demurrage.

11:00 **"Exploration, Development and Valuation of Sand and Gravel Deposits."** W. C. Huntington, Welborn & Huntington, Chicago.

11:30 **"Depletion, Depreciation and Income Tax Problems."** W. I. Kircaldie, The American Appraisal Company, St. Louis.

12:00 **"Concrete Products Manufacture."** A. J. R. Curtis, Manager, Concrete Products Bureau, Portland Cement Association.

12:30 **Adjournment for luncheon,** when an address will be made by Hon. Harry Bartow Hawes, member Committee on Interstate and Foreign Commerce of the House of Representatives.

FIRST DAY, TUESDAY, JANUARY 22

Afternoon Session

2:00 **"Geology of Sand and Gravel Deposits."** C. L. Dake, Assistant Geologist, Missouri State Geological Survey.

E. Guy Sutton, Vice-President, Carmichael Gravel Company, Danville, Ill.

R. Snoddy, Coon River Sand Company, Des Moines, Ia.

3:00 **An Address.** W. J. McGarry, Manager of the Open Top Car Service, Car Service Division, American Railway Association, Washington, D. C.

3:30 **"Equitable National Car Demurrage Rules."** T. E. McGrath, McGrath Sand & Gravel Company, Lincoln, Ill.

4:00 **"What Recent Theory and Practice in Concrete Design Mean to Sand and Gravel Producers."** Col. H. C. Boyden, Portland Cement Association.

4:15 **"Washed Gravel as Railroad Ballast."** Earl Zimmerman, Ohio Gravel Ballast Company, Cincinnati.

4:30 **Open Forum on "Transportation and Transportation Equipment."**

"The Advantages of Steam Locomotives and Large Size Standard Gauge Cars." David Alexander, Dixie Sand & Gravel Corporation, Petersburg, Va.

"Advantages of Gasoline Locomotives and Small-Unit Cars." J. L. Shiely, J. L. Shiely Company, St. Paul.

"Conveying with Cableway Dragline Excavators." C. H. Young, President, Robbins-Young Company, Minneapolis. Jesse A. Shearer, Indiana Gravel Company, Indianapolis.

"Barges for Sand and Gravel Transportation." H. H. Halliday, H. H. Halliday Sand Company, Cairo, Ill.

Alex. W. Dann, Keystone Sand & Supply Company, Pittsburgh.

"Pumps and Pipe Lines as Conveyors." Hugh Haddow, Jr., Menantico Sand & Gravel Company, Millville.

H. D. Clouse, Superintendent, Lincoln Sand & Gravel Company, Lincoln, Ill.

"Storage and Shipping Facilities." Gordon Smith, J. C. Buckbee Company, Consulting Engineers, Chicago.

5:00 **Adjournment.**

SECOND DAY, WEDNESDAY, JANUARY 23

Morning Session

10:00 **An Address.** W. C. Markham, Washington, D. C., representing The American Association of State Highway Officials.

10:30 **An Address.** J. T. Voshell, District Engineer, Chicago, representing The Bureau of Public Roads.

11:00 **Open Forum on Operating Problems.** "Stripping," W. P. Carmichael, President Carmichael Gravel Company, St. Louis.

"Steam Shovel Maintenance," L. B. West, Standard Sand & Gravel Company, Kinston, N. C.

"Dragline Advantages."

"Pump Maintenance," Thomas J. Duffy, President, Ohio River Sand Company, Louisville, Ky.

"Grizzlies," John Wunder, John Wunder Company, Minneapolis.

"Conveyors," J. H. Wagoner, Boonville Sand & Gravel Company, Utica, N. Y.

"Sand Recovery and Sizing," John Prince, Stewart Sand Company, Kansas City.

"Crushers," T. I. Weston, of Weston & Brooker, Columbia,, S. C.

11:30 **"Economy of Production,"** W. E. Rogers, Arkansas River Sand Company, Sand Springs, Okla.

11:45 **Open Forum on Advertising.** A. D. Greenfield, Chehaw Sand, Gravel & Mfg. Company, Atlanta.

R. G. Hengst, Universal Sand Company, New Castle, Pa.

12:30 **Adjournment.**

SECOND DAY, WEDNESDAY, JANUARY 23

Afternoon Session

2:00 **Consideration of Report of Board of Directors.**

2:15 **Annual Election of Officers.**

2:30 **"Ton vs. Cubic Yard as a Basis of Selling." H. B. Springer** Dixie Sand & Gravel Company, Chattanooga, Tenn.

J. E. Carroll, J. E. Carroll Sand Company, Buffalo, N. Y.
George Rogers, Union Rock Company, Los Angeles, Cal.

3:00 **"By-Products as Openings for Surplus Material." Concrete Brick.**

A. P. Burke, Atlanta Sand & Supply Company, Atlanta.
K. F. Kressler, Warren Sand & Gravel Company, Easton, Pa.

Mixed Mortar Plants.

3:30 **Motion Pictures.**

"Tests for Better Roads." This film illustrates tests conducted by the Bureau of Public Roads to determine the durability of road building materials, and also some of the unusual machinery used in making the tests.

"Roads to Wonderland." This film illustrates scenic spots reached by roads that are being built by the Federal, State and County governments, including Mount Hood in the Oregon National Forest, Crater Lake in Crater Lake National Park, and Yosemite National Park.

(These two pictures are shown by courtesy of the U. S. Department of Agriculture, Bureau of Public Roads.)

"A Mixed Mortar Plant"—Blue Diamond Material Company.

"A Sand and Gravel Operation in the Northwest"—Columbia Digger Company, Portland, Ore.

"The Manufacture of Shope Concrete Brick." Shope Brick Co., Portland, Ore.

5:00 **Adjournment of the Convention.**

THIRD DAY, THURSDAY, JANUARY 24
10:30 A.M.

As a courtesy to producers in attendance at the Eighth Annual Convention, the Missouri Portland Cement Company of St. Louis has agreed to place its sand and gravel plant in operation for one day in order that its engineering features **may be examined.**

It has been arranged that this shall be done on the day immediately following the adjournment of the convention and all are invited to stay over and be the guests of the Missouri Portland Cement Company.

(The exhibits to be displayed in convention room have been loaned to the Eighth Annual Convention through the courtesy of the Bureau of Public Roads, Washington, D. C.)

The Big Problem of the Slate Quarry Industry

How to Make Roofing Slate Manufacture Independent of a Small Group of Closely Organized Skilled Laborers

IN his *Slate News Bulletin* for January 2, 1914, W. S. Hays, secretary of the National Slate Association, begins, "Every year in every way slate will be used more and more." Will it?

The answer rests with slate quarry men who are at last organized to face the problem frankly and courageously. Nothing is to be gained by side-stepping the issue. While possible remedies may be various, the issue is single. Our own suggested remedy, which follows Mr. Hays' article, is not based on an intimate study of the slate industry, but on observations of the present-day tendency of all business and of the quarry business in particular.

While we have some faith in faith cures, we suspect it will take something more than faith to remedy present conditions in the slate roofing industry. These conditions we have portrayed in the following (Mr. Hays' own words):

Shall the Union Be Allowed to Dominate the Vermont Slate Industry?

Recently a prominent Vermont slate producer had the following experience:

Slate from a certain vein was being hoisted to the slaters' huts. They decided that it was not suitable for slate making so pitched the slabs over the dump. The operator was very much surprised, but thought he would do a little experimenting before saying anything. The following Saturday afternoon, after the men had gone home, he took one slab, broke and split it, and then trimmed the slates. From that one slab he made 1¼ squares of good slate. (One square equals 100 sq. ft. of laid roofing.) The following Monday, when the slaters learned of his achievement, they promptly went out on a strike, claiming that he not being a member of the union had no right to make slates.

That was a fine state of affairs! A man not allowed to make slates in his own quarry, notwithstanding the slabs from which he made the slates had been rejected by the men themselves.

The strike was not of long duration, as apparently it was called merely to rebuke the "boss." Nevertheless, such action typifies the spirit which is slowly but steadily and insidiously creeping into the Vermont slate fields.

Unionism in this territory is not a new thing by any means. It dates back more than 15 years, but until recently it has been quite dormant. It seems that there was in the past a "dead-line" at Poultney, Vt. South of that line the slaters were well organized; north of it, there was no union. Possibly the fact that north of Poltney the men were paid 10 cents an hour more than union wages had something to do with it.

Back in 1907 there was a widespread strike of slaters, but it happened to come at an opportune time for the producers. They had large stocks on hand and a quiet market; the strike gave them an opportunity to dispose of their product with less current expenses than usual. They also made good use of their pit men in cleaning up and in development work. A few months later the men returned, most of them thoroughly disgusted with the treatment accorded them by the union. It was common knowledge that those who had bank accounts received no strike benefit. It was another typical example of the "thrifty man paying for the laggard."

While the results of this strike did not break up the union, it was given a decided setback, which lasted for many years. Recently a walking delegate has appeared in the section again and is stirring up trouble. His activities are not confined to "south of Poultney" or just to slaters; the mill workers and pit men are being subjected to that steady pressure which sooner or later causes the men to yield.

Possibly the delegate will have better success with the pit men, as they are of a far more ignorant type; one thing only is a handicap and that is the foreigner's inborn dislike to give up money for something he cannot see. What success he will have with the mill-workers remains to be seen. These mer as well as the slaters have been Americans for several generations back and are less likely to be swayed by the union's illogical promises. Even they show signs of yielding.

An analysis of working conditions and wages will be of interest, if only to show how well off the men now are and yet, how slowly but surely they are blindly walking to their destruction. Probably no workers in the entire section are as well off as the slate workers; the lowest pay is 57 cents an hour and in some cases averages more than $1 an hour for slaters who are on piece work. They have work the year round and the cost of living is far below that in the cities. All in all, their lot is not a bad one and yet by their very actions they may stifle the industry.

The slate industry cannot stand much of an increase in wages and certainly cannot be allowed to get into a position where it will be subjected to strikes and inefficient workmanship. Increase in wages and curtailment of individual production are the two watchwords of unionism and once they get a foothold in the minds of the workmen, the slate industry must pay the penalty.

Slate making at its best is a wasteful

operation; the very nature of slate prevents it being otherwise. Because of this, the cost of slate roofing is far above that of its competitors. The industry has a stiff fight on its hands to regain the market it once enjoyed but which is now controlled by the manufacturers of substitute materials. Anything which adds to the cost makes it more difficult than ever to market their product and yet, the men in the quarry are listening to the siren songs of the agitator when to do so is but to add another millstone to the load already borne by their own "bread and butter."

If the men would only stop and think for themselves rather than listen to the men who are passionately illogical, they could not help but see that they are unionizing themselves out of their life-long trade. But how blindly and blissfully they go ahead!

This is one point at least where every slate producer should and could co-operate with his neighbor. By combining forces—not to arbitrarily force the men to do their will—but to get them together, talk to them like "Dutch uncles" and show by figures that the industry as a whole is bound to go under unless they are willing to meet the operators half way.

Added to these local disturbances, there is plenty of evidence that all over the country, the union controlled roofers (men who lay the slates) are prepared to strike for higher wages and at the same time curtail production. As an instance of the latter development: it was a common thing for a roofer in the old days to lay at least 10 squares in a 10-hr. day; now the unions have in some cases put the limit at two squares for 8 hr. In some states the roofers will not lay slates that have been punched at the quarry, but will repunch them, thus taking extra time.

It is clearly up to the slate producers to get together on this proposition and combat it as a united industry. They can do it and they will be closely watched by every other quarryman.

What Is the Answer?

There may seem little in common between building stone and roofing slate other than the fact that both come out of a quarry. Yet roofing slate is passing through exactly the same transformation that the cut-stone quarry industry did. Where today are all the brownstone quarries; the freestone quarries; hundreds of granite and limestone quarries? Most of them are either changed to crushed-stone quarries or passed out of existence. A few survive to make gravestones and building stone for monumental structures, for which, as yet, concrete has not been accepted as appropriate. But even in these fields cut-stone is losing out year by year.

The stone industry has gone the way of every other industry, the pace for which has been set by Henry Ford and other geniuses like him. No industry can expect to survive present competitive conditions that is dependent upon a small group of skilled manual laborers. We are in the 20th century—well advanced in it—18th century methods are out of date. That is pretty near the whole story.

Unless roofing slates can be made by unskilled labor with machines the roofing-slate industry is foredoomed to practical annihilation. A small amount of roofing slate will always be in demand by those who put esthetic considerations above cost, convenience, etc. But it will never be on a real competitive basis with other roofing materials.

We know that some progress has been made in slate-splitting machines, but if we are correctly informed, such as has been made was made with scant encouragement from slate manufacturers. The time has come to take the bull by the horns. If machines can not be developed, let slate quarrymen resign themselves to their fates and go in for slate granules, or something else that can be done with machines.

Far bigger and more intricate mechanical problems have been solved, and solved very successfully, than the development of a machine for making slate shingles. But the incentive must be present to attract engineering and inventive talent. A few live slate quarry operators can set the pace.

Illinois Department of Public Works Rejects Cement Bids a Second Time

ILLINOIS newspapers are carrying the following news item:

The Department of Public Works and Buildings on December 11 postponed indefinitely the road letting scheduled for December 21, at which time bids were to have been received for 129 miles of road. This action was taken, the highway officials say, because of the department having been forced to reject twice within the last two weeks bids on the 4,000,000 bbl. of cement required for the 1924 road construction program.

A statement was issued recently, signed by Col. C. R. Miller, director of the Department of Public Works and Buildings; Frank T. Sheets, superintendent of highways, and Clifford Older, chief highway engineer, in which "uniformity" of bids of the various companies and "Pittsburgh Plus" methods were referred to. The statement follows:

"An analysis of the cement bids just rejected shows a marked uniformity in the prices bid by the various companies f.o.b. the different county seats. In general, the prices are apparently based on a mill price of $1.65 per barrel at Buffington, Ind., and the so-called 'Pittsburgh Plus' method of price-fixing seems to have been used. For example, in McLean county the delivered price f.o.b. Bloomington, the county seat, quoted by the Universal Portland Cement Co., whose mill is located at Buffington, Ind., is $2.07 per barrel net. The freight rate from Buffington to Bloomington is 42 cents per barrel, which results in a mill net price of $1.65 per barrel. The Marquette, Lehigh and Alpha Portland Cement companies, whose mills are located at La Salle, much nearer to the point of delivery, quoted the identical figure of $2.07 per barrel net delivered. The freight rate from La Salle to Bloomington is 32 cents per barrel, making a mill net price at La Salle of $1.75 per barrel. The public can draw its own conclusions. Both of these prices are deemed unfair.

"If Illinois had accepted the bids offered on the large quantity of 4,000,000 bbl., the state's action would have fixed the cement price for the Middle West for the year and every county, municipality, township and individual user would have been affected.

"The department has since January, 1921, stood four-square on the proposition that the state should receive a dollar in value for every dollar expended. Road contractors and other material producers have taken their contracts at fair and equitable prices. In fairness to those who have done so, and and in fairness to the people of Illinois, who pay the bills, the action announced Tuesday has been taken. There is nothing to warrant any increased prices. The price of coal, which is one of the large factors in the cost of producing cement, has been steadily declining, and the market on all other basic commodities is on a stable or declining basis.

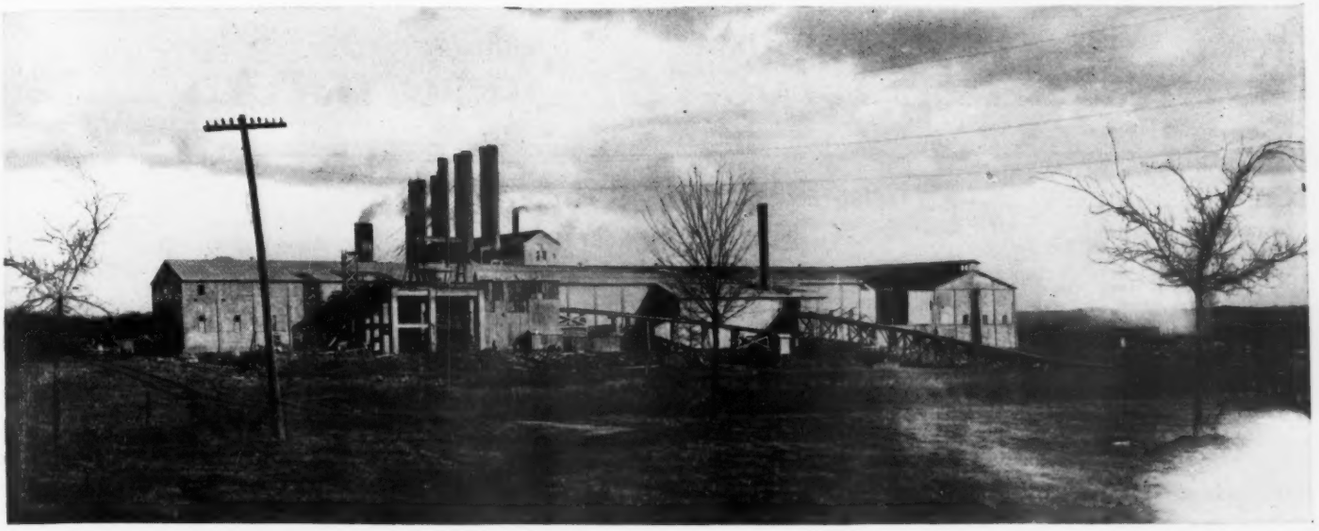
"Investigations by the department have been under way for some time and will be continued in an effort to secure fair and equitable cement prices not only for the forthcoming year but for the years to follow.

"C. R. Miller,
"Director.
"Frank T. Sheets,
"Superintendent Highways.
"Clifford Older,
"Chief Highway Engineers."

Knickerbocker to Move Offices to Albany, N. Y.

THE KNICKERBOCKER CEMENT CO., with plant at Hudson, N. Y., is moving its general offices from New York City to Albany. According to local newspaper reports, the company has chosen this as a central point of distribution for its New York and New England business.

The entire front of the eighth floor in the new City Savings Bank building has been leased by the cement company and it is expected that a good part of the organization will be moved here from New York City during the month of April, including the bookkeeping and auditing department, sales manager and a vice-president.



Plant of the Monarch Portland Cement Co. at Humboldt, Kan., which has just been sold to the Colorado Portland Cement Co. of Denver, Colo.

Monarch Portland Cement Company Sold to Colorado

A WICHITA (Kan.) news item of December 26 reports the sale of the Monarch Portland Cement Co. plant at Humboldt, Kan., for $1,725,000, to the Colorado Portland Cement Co., of Denver. "There are in Wichita and nearby territory about 50 stockholders in this company. Henry Wolf of Cheney is president, and A. C. Kreitzer of this city is vice-president. The sale of the property will bring to Wichita and adjacent territory $700,000 or $800,000.

"Several years ago the Monarch Portland Cement Co. was weakened. Some of its stock was sold in Wichita as low as 10 cents on the dollar, but a group of men who had some money and some credit, determined to make the thing go. As a result, they are getting $1.05 a share in this sale.

"A. C. Kreitzer, who is vice-president, went to Humboldt and took active charge of the plant for several years."

Big Crushed Stone Contract in Missouri Opens Two Plants

A CONTRACT for 225,000 tons of crushed rock for highway building has been let to R. Newton McDowell, of Kansas City, Mo., who will open two quarries to fill this contract and to furnish stone for the regular market.

One of the quarries which will be opened is at Gallatin and the other at Smithville. Both are old quarries but have plants that are too small and antiquated for the desired production, so new machinery will be added to bring them up to date and to capacity. A No. 12 gyratory will be installed at the Gallatin plant and a No. 18 at the Smithville plant.

These quarries are situated in a locality in which there is a considerable market for crushed stone both for the ordinary commercial purposes and for railroad ballast. The Wabash and Rock Island roads have both contracted to take ballast from the remodeled plants.

Mr. McDowell was in Chicago recently to purchase machinery for these plants.

New Head of Sandusky Cement Company

J. B. JOHN is now president and general manager of the Sandusky Portland Cement Co. His election to that office by the board of directors was announced in Rock Products in the issue of December 1.

J. B. John

Mr. John continues in his offices of vice-president and general manager of the Newago Cement Co. and vice-president of the Petoskey and Manitowoc Cement companies. In another place in this issue is noted that the Petoskey company claims to have broken all production records for a two-kiln plant.

Goes to China to Start Gypsum Industry There

E. H. FISHACK, of North Baltimore, Ohio, called on Rock Products January 5 on his way to San Francisco, where he will embark for China. He goes under contract with the Chino-American Industrial Development Co. of Hong Kong, China, to start the gypsum industry in that country.

China has large deposits of gypsum rock but none of these has ever been developed in the modern sense of the word. In all China, with its four hundred million or more of people, there is practically no use made of one of the most valuable and important building materials known.

But China is modernizing itself in a way that none of us fully appreciates, and as an essential part of that modernization it is rapidly developing one of the most modern and important branches of all, the rock products industry. The readers of this paper know of the big cement plants that have been built there recently. Now other parts of the rock products industry are to be developed.

Mr. Fishack says that the shortage of houses so complained of in the United States and Europe is as nothing to that of China in which at least a fourth of the population is without proper shelter. Modern buildings are being preferred and his company has at present 250 buildings under construction in one contract.

The deposits of gypsum which are to be opened are beyond Canton at a considerable distance from the coast. They will be opened at once and it is the present intention of the company to begin making plaster as soon as possible.

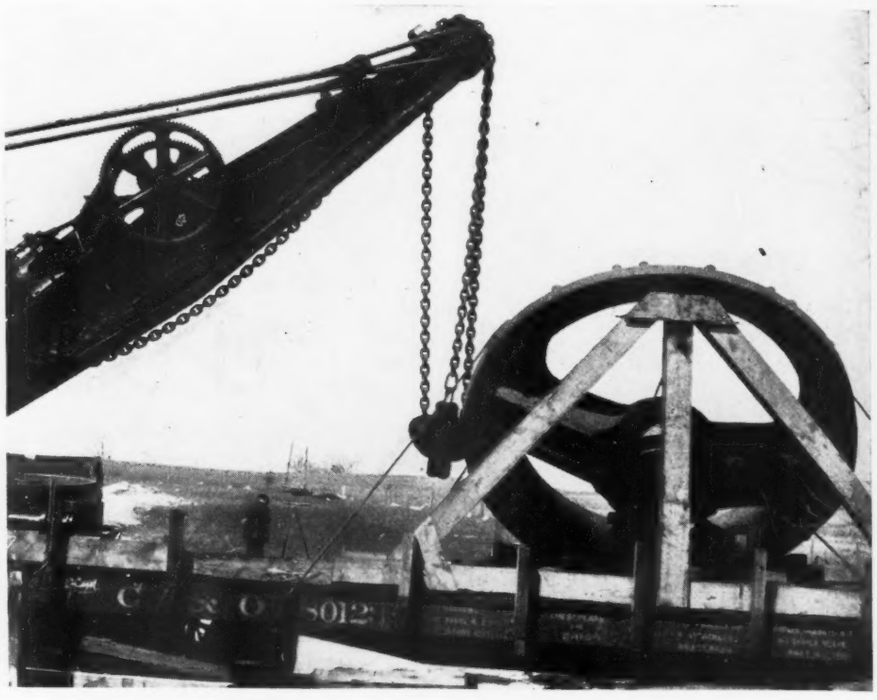
Mr. Fishack is well known in the gypsum industry. He was one of the pioneers of the gypsum plaster industry and has built and operated plaster mills in Ohio. Of late he has been doing consulting work.

Hints and Helps for Superintendents

Using the Steam Shovel for a Crane

THE problem of lifting a heavy piece that is beyond the capacity of the ordinary locomotive crane, is one that occasionally bothers the superintendent of a gravel pit or a stone quarry. Sometimes to unload such a piece as that shown in the picture requires considerable construction along with the use of jacks, wedges and a lot of valuable time.

The illustration shows how a 5-ton steam shovel was employed to unload the spider of a No. 18 McCully gyratory crusher from a flat car at the American Crushed Rock Co.'s plant at White Sulphur, Ohio. The method is so simple that no further explanation is required than that given by the picture itself, and the main value of the picture is that it may suggest a similar solution of the problem to some one who has it presented to him.



A steam shovel may be used as a crane for lifting a heavy piece

Sand and Gravel Bin with Concrete Bottom

THE interesting feature of the bin shown in the photograph is that the bottom is a slab of reinforced concrete, 12 in. thick. The plant is on the edge of Massillon, Ohio, and deliveries are altogether by truck. For ease in loading, the type of bin shown has been adopted; that is, with bottom gates over the driveway so that trucks may be loaded quickly and so that all that the bin contains is "live" storage.

The usual way of constructing such a bin bottom is to build it of 2x12-in. timber set on edge and spiked together. As these timbers are wet from the drainage of the sand and gravel, they are apt to rot after having been in service for some time.

Timber gravel bin with reinforced concrete bottom

The concrete bottom is free from this danger. It is also more comfortable for the truck drivers, as there is no leakage except that which comes from the loading gate. This permits the driveway under the bin to be kept in better condition.

There is very little difference in the cost of such a bin and one with a timber bottom. With the sand and gravel available at the plant, as it would be in many cases, the concrete bottom would probably be cheaper.

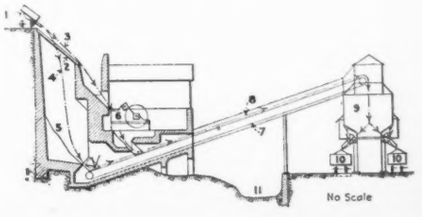
This bin is a part of the plant of the Clemens Gravel Co., Massillon, Ohio.

Design for a Primary Crushing Plant

THE Chino Copper Co.'s "mine" at Santa Rita, N. M., is nothing but a big stone quarry, employing well drills for blasting and loading by steam shovel in the ordinary way. In connection with the quarry a primary crushing plant is operated, the design of which should interest crushed stone producers. It is described as follows in the current *Engineering and Mining Journal:*

"Railroad cars discharge onto a grizzly built of I-beams covered with manganese steel and 8 in. apart. The undersize drops into the bin; the oversize slides into the hopper of the crushers, of which there are two. The first crusher to be used was a 48x60-in. jaw breaker of the Blake type, which proved hardly powerful enough to reduce the big pieces of ore, so the second crusher, 66x84 in., was added. This one crushes to 8 in. The older crusher is used now only in an emergency.

"The weight of the crusher is 475,000 lb. The play between the jaws is 3¼ in. The shaft operating the pitman makes 80 r.p.m. A set of railroad ties serves as a cushion



Simple primary crushing plant

to protect the concrete abutment, at the back of the crushers, from the violent impact of the descending ore. Likewise, steel chains are hung above the jaws of the crushers, to protect them from excessive violence. Above each crusher a plate of manganese steel serves to check the impact of the ore and to prevent arching.

"The ore drops from the crusher onto a steel pan conveyor. This moves the crushed ore up a 15-deg. incline to the loading bin, which has a capacity of 567 tons. It is 40 ft. long, 14½ ft. at the base, and 23 ft. high.

This storage system uses a track suspended on wire ropes instead of a trestle

Six chutes on each side enable two railroad cars to be loaded simultaneously. A car of 50 tons capacity is loaded in about 15 min. At first a gate was placed at the bottom of the bin chute but the effect of it was to build a column of ore and thereby to check delivery. Above the gate leading from the lower bin there are louvers to permit a man to poke the ore with a crowbar or to introduce a stick of dynamite, when the formation of an arch makes it necessary to loosen the packed ore by decisive methods.

"The total cost of the plant was $127,000, of which $42,000 was for labor and $85,000 for equipment. The cost of operation is 1.25c per ton of dry ore."

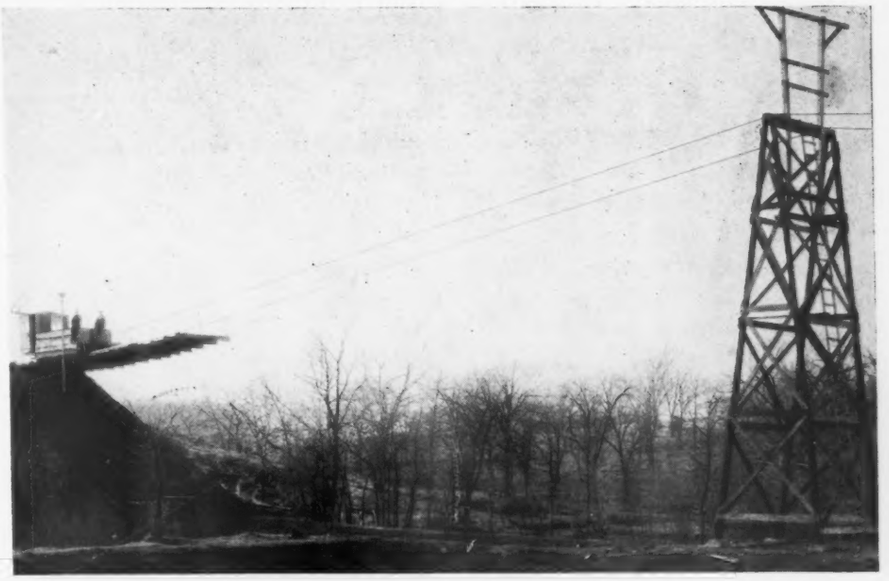
System of Storage or Disposing of Waste

The accompanying photographs illustrate a method of handling material which might be applied either to the storage of marketable material or to the disposal of waste overburden.

The peculiarity of this system is the use of a suspended track for one supported in the usual way by a trestle. Where a trestle is used there is a considerable loss of timber. Also it takes some time to build extensions to a trestle. With the suspended track all the material may be recovered to use again whenever the pile is to be extended, and if the construction has been properly designed the time required for making the extension will not be long.

The track shown in the pictures is supported by two 1½-in. cables which are each 640 ft. long, from anchorage to anchorage. The supporting tower is 40 ft. high. The ties are hung to the supporting cables by hangers which hold the ties 30 in. below the cables, and this brings the center of gravity below the cables. A bumper is provided to stop the car at the right place for dumping.

The car shown in the picture weighs 5 tons and the usual load weighs about 10 tons.



Another view of the storage system which shows the construction of the tower. The bent on top of the tower is to sustain the trolley wires

Tightening the cables at the anchorage is by means of the four-lug clamps shown here which hold the turnbuckle

The tightening of the cables is by means of a four-lug clamp which holds the turnbuckles. This is shown in one of the pictures. The turnbuckle is turned by means of a bent piece of pipe.

The pictures show the car being handled by an electric locomotive and the bent on top of the tower carries the trolley wire. But the system is just as well adapted to use with gasoline or steam locomotives.

Cement Plant Proposed for Leavenworth, Wash.

NEWSPAPER reports say there is a possibility of a cement plant being built at Leavenworth, Wash. It is stated that a company called the Northwest Portland Cement Co. will be formed by John D. Atkinson, of Leavenworth, and his associates.

Program of St. Louis Convention National Crushed Stone Association

BELOW is the program for the seventh annual convention of the National Crushed Stone Association, at the Statler Hotel, St. Louis, Mo., January 21-24, inclusive.

From every present indication this will be the best attended convention in the history of the American quarry industry. Every man (or woman) who operates a quarry and crushing plant is invited to attend.

A new and particularly attractive feature of the convention will be an exhibit of model machinery and equipment. This will be held in a hall adjacent to the meeting room. The 50-odd associate members of the National Crushed Stone Association will take part, and responsible representatives of machinery and equipment manufacturers will be in charge of booths where they may be consulted by visiting quarrymen.

A 30-minute recess will be taken in the middle of each session (with the exception of the first morning session) during which quarrymen will have an opportunity to visit the exhibits and compare notes and exchange ideas with one another.

The moving picture show on Monday evening promises to be one of the most educational features of the whole meeting, and no quarry operator will want to miss it. The annual banquet on Tuesday evening will have unusual entertainment features. As guests there will be L. W. Baldwin, president of the Missouri Pacific Ry., and other distinguished men.

The round-table discussions will take up problems which quarrymen all over the United States have given as THEIR HARDEST PROBLEMS. The chairman of the program committee knows of many operators well qualified to discuss each particular problem and those operators will be asked to contribute from their funds of knowledge and experience.

The program committee honestly feels that a trip to St. Louis is justified by any one day's features of the program—not to mention the ample provisions being made for entertainment and good fellowship.

Operators intending to be at St. Louis should write or wire at once for hotel reservations, noting that they are attending the convention of the National Crushed Stone Association. They should also ask their local railway agents for convention certificates, which will entitle them to half-fare round trips, in case 250 visitors present such certificates at St. Louis.

Submitted by the Conventon Program Committee.

E. J. KRAUSE
A. P. SANDLES
NATHAN C. ROCKWOOD
Chairman

December 29, 1923

MONDAY FORENOON—JANUARY 21, 1924

10:00 A.M.—**Address of Welcome**—The Mayor of St. Louis.
Reply on behalf of Association—President Schmidt.

10:15 A.M.—**Annual Message of the President**—President Schmidt.
Appointment of Committees.

10:30 A.M.—**Ten-Minute Reports of the Directors for their Respective Localities Covering:**
(1) Review of Industry—Production—Demand—Prices.
(2) Relations with Railways—Rates—Car service—Ballast.
(3) Labor situation—Scarcity or surplus—Wages—Immigration—Methods of overcoming shortage.
(4) Outlook for 1924 in relation to (1), (2) and (3).

MONDAY NOON

Noon get-together Luncheon.

MONDAY AFTERNOON SESSION

2:00 P.M.—**Reports and Discussion of Costs of Quarry Operation.**
Report of Committee on Cost-Accounting.
"Cost-Keeping, Labor Handling and Administration of a Moderate-Sized Quarry Plant." By R. N. Van Winkle, general manager, Hawkeye Quarries Co., Cedar Rapids, Ia.

2:45 P.M.—**Recess of 30 minutes to inspect exhibits.**

3:15 P.M.—**Quarry Problems and Their Solution.**
(a) **How to Find New Capital?**
"Exploration and Geological Examination of a Quarry Property and Their Relation to Financing." D. B. Rush, engineer, R. W. Hunt Co., testing engineers, Chicago, Ill.
"Market Surveys and Sales Possibilities Analyzed for Financiers." Wm. Chapin Huntington, Engineer and Business Counsellor, Chicago, Ill.

3:45 P.M.—**Disposal of Screenings and Fines.**
"Agricultural Limestone." By E. M. Lamkin, president, National Agricultural Limestone Association.
"Concrete Products Manufacture." By A. J. R. Curtis, manager, Concrete Products Bureau, Portland Cement Association.
"Crusher Sand." By R. W. Scherer, Sales Engineer, Western Lime and Cement Co., Milwaukee, Wis.

4:30 P.M.—**Round Table Discussion of Quarry Problems.**
Subjects suggested by Quarry Operators are:
Stripping methods.
Drilling.
Elimination of spalls in lime quarries.
Mining vs. open-pit quarrying.
Effect of blasting on nearby buildings.
Lowering a quarry floor.
Transportation systems—the best.
Hoist information.
Crushing and pulverizing experience.
Screening and sizing with particular attention to clay removal
Experience with new types of grizzlies.
Possibility of standardizing sizes.
How to provide for prompt repairs in case of breakdowns.
Relay rails vs. new rails.
Sales of special products through dealers.
Is plant storage necessary?

MONDAY AFTERNOON SESSION—(Continued)

Sales credits and collections.
Winter overhead—how to take care of?
Labor problems.
Competitive problems.
Ballast problems.

MONDAY EVENING—MOVING PICTURES

"Modern Excavating Machinery in Action"—By the U. S. Bureau of Mines.

"A Modern Blast"—By the Hercules Powder Co., Wilmington, Del.

"Dynamite at Work"—Including slow motion of a big blast. By E. I. du Pont de Nemours Co., Wilmington, Del.

"A West Coast Quarry and Crushing Plant." By Frank W. Bilger, president of the Oakland Paving Co., Oakland, Calif.

"The Plant and Operation of the Blue Diamond Materials Co., Los Angeles, Calif.—Including big quarry operation, blasting and the Hay process of wet-mixed lime mortar—sales promotion and service in the busiest city in the U. S. A.

"The Manufacture of Shope Concrete Brick." By the Shope Brick Co., Portland, Ore.

And various other films of equipment and quarry plants in action—caterpillar shovels, grizzlies, locomotives, etc.

TUESDAY FORENOON—JANUARY 22

9:00 A.M.—**"Depletion, Depreciation, Obsolescene, Repair Account, etc., in Connection with Income Tax Reports."** By C. C. Griggs, Assistant Head, Engineering Division, Office of the Commissioner of Internal Revenue, U. S. Treasury Department.

9:30 A.M.—**Discussion of Depletion, Depreciation and Related Subjects.**

10:00 A.M.—**"Electric Power Contracts."** By Louis H. Egan, president of the Union Electric Light and Power Co., St. Louis, Mo.

10:30 A.M.—**Recess to visit exhibits.**

11:00 A.M.—**"The Application of Electricity in the Crushed Stone Industry."** By E. W. Pilgrim, Industrial Engineering Department, General Electric Co., Schenectady, N. Y.

11:30 A.M.—**Reports of Committees**—General discussion.

TUESDAY NOON

Luncheons and Round Table Discussions by Groups.

(a) **Ballast Producers.**
(b) **Concrete Aggregate Producers.**
(c) **Agricultural Limestone Producers.**
(d) **Superintendents.**
(e) **Manufacturers' Division.**

TUESDAY AFTERNOON

2:00 P.M.—**Symposium on Drilling and Blasting.**

(a) **"Well Drilling."** By M. B. Garber, the Sanderson Cyclone Drill Co., Orrville, Ohio.

(b) **"Standardization of Drill Joints and Properly Balanced Tools."** By Fred A. Gill, Lebanon, Penn.

(c) **"Blasting Data."** By S. R. Russell, E. I. du Pont de Nemours & Co.

TUESDAY AFTERNOON SESSION—(Continued)

(d) **"A New Method of Blasting."** By J. Barab, Hercules Powder Co., Wilmington, Del.

General Discussion.

3:00 P.M.—**Recess to visit exhibits.**

3:30 P.M.—**"Crawler Trucks Applied to Quarry Shovels."** By Harvey T. Gracely, the Marion Steam Shovel Co., Marion, Ohio.

3:45 P.M.—**General Discussion of Crawler Trucks and Traction Wheels for Quarry Shovels as Labor Savers.**

4:00 P.M.—**"Developments in Secondary Crushers."** By C. S. Darling, Sales Engineer, Pennsylvania Crusher Co.

4:15 P.M.—**"Stock Piling."** By H. E. Bair, general manager, the France Stone Co., Toledo, Ohio.
General Discussion of Stock Piling—Winter Operation, etc.

4:30 P.M.—**Committee Reports—General Business.**

TUESDAY EVENING

Annual Banquet of the National Crushed Stone Association.

WEDNESDAY MORNING—JANUARY 23

9:00 A.M.—**Report of the Research Committee.**
General Discussion.

9:30 A.M—**Ten-Minute Talks on How the National Crushed Stone Association Can Develop.**

10:00 A.M.—**Election of Officers.**
Unfinished Business.
New Business.

10:30 A.M.—**Recess to visit exhibits.**

11:00 A.M.—**"Application of Geology to Quarrying."** By H. A. Buehler, State Geologist of Missouri.

11:30 A.M.—**General discussion** of such quarry problems as "Clay Seams" and "Screening Wet or Damp Stone."

WEDNESDAY NOON

Group Luncheons by Territorial Groups.

WEDNESDAY AFTERNOON

2:00 P.M.—**"How Crushed Stone Producers Can Prepare Advertising Copy to Interest Architects, Engineers and Contractors."** By Charles A. Breskin, Advertising Manager, Rock Products.

2:15 P.M.—**"Selling Quarry Products."** By Russel S. Rarey, Marble Cliff Quarries Co., Columbus, Ohio.

2:30 P.M.—**Recess to visit exhibits.**

3:00 P.M.—**"Outlook for the Construction Industry."** By E. J. Brummer, Editor, "The American Contractor, Chicago, Ill.

3:15 P.M.—**"Outlook for Railway Construction and Improvement Work."** By F. J. Stimson, Chief Engineer of Maintenance, Southwestern Region, Pennsylvania Railroad System, St. Louis, Mo.

3:30 P.M.—**"Outlook for Municipal Construction Work."** By W. W. Horner, Chief Engineer of Sewers and Paving, City of St. Louis.

4:00 P.M.—**Unfinished Business.**

WEDNESDAY NIGHT

A theater party can be arranged for those who stay over.

THURSDAY

An excursion to the Quarries and Crushing Plants of the Columbia Quarry Co. can be arranged for those who want to make the trip.

Texas Railroad Rate on Cement Attacked

COMPLAINT has been filed by the Iola Cement Mills Traffic Association against the interstate rate adjustment on cement in the state of Texas, according to Interstate Commerce Commission docket No. 15,427, which has just been received by U. S. Pawkett, manager of the San Antonio Freight Bureau.

The complaint is in addition to docket No. 15,151 of the Oklahoma Portland Cement Association which case was set for hearing in Denver, Colo., on February 7. An effort will be made to get the Denver hearing postponed and consolidate the cases since they involve the same questions. Cement rates are not involved in the Oklahoma case nor in the Fort Worth-Dallas case which attacked most of the rates in Texas.

Fake Cement Company Official Gets Jail Sentence

DWIGHT HARRISON, former vice-president of the R. L. Dollings Co. of Ohio, was sentenced to three years in the Ohio Penitentiary and fined $5000 by common pleas judge Robert P. Duncan. He was found guilty of making false statements concerning the holdings of the Phoenix Portland Cement Co. of Ohio, whose stock was being sold by the Dollings company.

Harrison, or his counsel, made no comment at the sentence was pronounced, which ended one of the bitterest legal fights in the history of Franklin county courts. Appeal will be taken.

Harrison is facing trial in the federal court here on an indictment charging misuse of the mails in connection with the sale of Dollings stock. This trial is scheduled to start the middle of January.

Present Use of Slag for Concrete Aggregate

THE use of slag for concrete aggregate is increasing in the United States, but by no means all that is produced is so used. *Iron Age,* in its annual review number, estimates the total slag production of the United States at 20,000,000 tons and says that about 7,000,000 tons, or just a little over a third, is used as follows: 45 per cent goes to roads and city paving, other than concrete; 25 per cent to railroad ballast; 25 per cent to aggregate in concrete; 1 per cent to roofing, and 4 per cent for miscellaneous applications such as slag brick, concrete blocks, etc. The above is for air-cooled slag. It is further estimated that about 1,000,000 tons of slag is granulated yearly for use in the manufacture of portland cement.

There are 96 plants crushing and marketing slag in the United States. The process is simple; the slag is dug by steam shovels and fed to crushers, after which it is elevated and passed over a magnetic separator roll to remove metallic iron. It is then screened into sizes, as crushed stone is screened, and loaded into bins and cars in the ordinary way. Plant capacities run from 300 to 4000 tons per day.

Slag has an advantage over other forms of aggregate in its light weight. The usual specifications call for a weight of 70 lb. per cubic foot or more. The concrete made with slag weighs about 10 lb. less per cubic foot than concrete of equal strength made of sand and gravel or crushed stone, according to tests which have been published.

The economic reason for the use of slag is that it decreases the price of steel by diminishing the cost of making. It is estimated that each ton of slag that is not sold and used costs the steel makers a dollar to take care of it as waste.

Official Findings

Proceedings for the American Society for Testing Materials, Vol. 23, Part II, gives in detail the tests which the U. S. Bureau of Public roads has made on slag as concrete aggregate. It is written by Raymond Harsch. A summary of the findings resulting from the tests is as follows:

1. The unit weight of blast-furnace slag as produced commercially has little if any effect upon the structural strength or the wearing property of the resulting concrete.

2. A limit of 70 lb. per cubic foot would admit practically every well-graded crushed slag product.

3. The gravel used in these tests is one of accepted quality and is considered to be of average strength. The limestone used for comparison with the slag is somewhat superior to the average limestone used for concrete. The strength of all of the slag concretes exceeded that of the gravel concrete. The average strength of the slag concrete is equal to the strength of the limestone concrete.

4. Because of the excessive chipping at the edges of the wear blocks, the wear test is not considered a very favorable indication of the resistance of concrete to wear. It is a means of comparing the value of various types of concrete subjected to the action of the shot, and is interpreted as such by the author. On this assumption, the wear-resisting properties of slag concrete are equivalent to those of the limestone concrete and superior to those of gravel concrete tested in comparison.

5. The physical properties of the slag when tested by the usual rock tests do not seem to be an important factor in determining the quality of the concrete made with slag as the coarse aggregate.

Associated General Contractors Meeting in Chicago January 21-24

THE Fifth Annual Meeting of the Associated General Contractors of America is to be held January 21, 22, 23 and 24 in Chicago at the La Salle Hotel. Officials of the organization state that indications already assure a record-breaking attendance.

The convention is to be held during the week immediately following the annual sessions of the American Road Builders Association and the Road Show, and a joint meeting of this body with the executive board of the contractors' organization will be held January 17.

"Cut Construction Costs," this is to be the keynote of the convention. The attack upon costs mainly will be launched through the medium of efforts aiming at fullest capitalization of weather conditions favorable to construction operations, an increased volume of winter building, and storage of building materials during periods of the year when construction is at its lowest ebb. By utilization of these means, it is being pointed out, the contractors' overhead will be reduced. They will be able to avoid the extra expense entailed by the present "sprint and spurt" character of the year as regards construction. They also will be able to hold skilled organizations together.

Not only will contractors who are anxious to secure the benefit of detailed discussion leading to conclusions attend these sessions, officials declare, but engineers and architects in large numbers will be present to make first-hand observations of the developments.

Among the addresses which will interest the producers of rock products are the following:

Quantity surveys.

Relationships between the highway commission and the contractor.

Resumption of railway construction.

Central concrete mixing plants.

Bonds as a gauge of responsibility.

A $2,000,000 Sand and Gravel Company Sale

AN investment of more than $2,000,000 was involved in a transaction whereby the Iron City Sand and Gravel Company of Pittsburgh has been acquired by several Cumberland, Md., business men. Among them are George Vang, president of the Vang Construction Co.; Henry Shriver, president of the First National Bank; James C. Shriver, former City Engineer, and Thomas B. Finan.

The new company will be headed by George Vang and has been engaged in the dredging of sand and gravel from the river at Pittsburgh for the last 30 years.

According to a newspaper report the earnings of the company for 1923 are estimated at $362,000, and for the last six years have averaged approximately seven times interest charges.

Gypsum Industry Keeps Up in Winter Months

UNUSUALLY mild weather throughout the country has made it possible for the United States Gypsum Co. to maintain its earning power during November and December, which ordinarily are unprofitable months. Earnings are running far in excess of last year, and current year's earnings will be the largest in company's history. In 1922 net earnings after all charges were $3,413,034, or $12.19 a share on the 221,522 shares of $20 par common stock on a 4 per cent annual dividend basis, after providing for dividends on the $6,013,800 7 per cent preferred stock. Company has no funded debt, and current assets on December 31, 1922, were $4,879,824, against current liabilities of $1,869,200, or a ratio of 2.6 to 1. Book value of common stock at close of 1922 was $45.35.

In November payment of a 20 per cent stock dividend was authorized, in addition to the regular dividends. A large expansion program is under way, and a good portion of the excess earnings is being used to buy new properties and erect new plants. Three plants are now under construction, in New York, Texas and Virginia.—*New York Wall Street Journal.*

Quarried from Life

By Liman Sandrock

Greetings!

1924—and a Happy New Year to you! For more years than many of us willingly acknowledge, we have repeated this wish to one another. But it has by no manner of means ever become trite, or stale, or meaningless. We cannot wish our good friends anything that Mother Earth yields us that is bigger and better than Happiness.

As we look back, each succeeding year seems fuller and more plenteous of the real things of life that are best for us. Even the lean, unfruitful years have yielded their measure of good in that they have made us more appreciative, given us fuller understanding, of the fat and fruitful years that followed.

Personally, we have always more or less harbored a grudge against Father Adam and his Rib for having so utterly abused the 100 per cent operating conditions that were mapped out for this pair in Paradise quarry. But, after all, the jolly mess they made of it has been so plainly held up to us, their children, that there's still a bright side to the short and disastrous history of this abandoned first quarry in the Garden.

This coming year, we believe, promises much happiness and prosperity to Adam's present children in the rock products industry. In the third week of the new year there will assemble in St. Louis the national organizations of the crushed stone and the sand and gravel industries. Both of these bodies have put forth their greatest efforts to outline programs that are far in advance of anything yet planned for national conventions; deeper study will be given operating problems, production and market demands; immigration and the labor situation will get their full share of attention, and business for the coming year will be intelligently considered and shaped.

The heads of our large and successful concerns have sacrificed much of their time and their money the past year to advance the industries as a whole, and they have shown a breadth and bigness in their desire to make their industries profitable and satisfactory to all concerned in them—both the little fellow and the giant. And this is a most happy way in which to begin this year of 1924, isn't it?

All of us must certainly feel assured of true happiness when we know that we are giving of the best that is in us—the ripened fruit of intelligent study, experience and observation. And we should also feel that we will be repaid many times over by what we get from the other fellow, too. This is the happiness that Rock Products wishes you in starting the new page in your industry's history.

We ask, too, that you be not unmindful of what this magazine is laboring to do to further the advancement of your industry—in traveling from Coast to Coast and from Lakes to Gulf, ever discovering and reporting on matters that will better production and increase operation; in studying the technical writings of the world's authorities and digesting them for your benefit; in according willing assistance and counsel to the many who daily seek its aid; in making, regardless of money and effort, a journal which we think worthy of its name and an indispensable tool for the workshop of the industry. And we are more than happy when we have accomplished any of these deeds for the good of the order.

Hence, we wish you, one and all, a Happy and Prosperous New Year—full to the brim of all that will satisfy and advance you. May the good that you have shown others return to you and in plenteous measure, and may your pride in your industry make you both grateful and humble!

Service

SERVICE is the greatest thing in the human calendar, and the better we equip ourselves the better we serve, because in the expansion of the mind comes the better understanding of how best to serve. No matter what your fortunes in life, the greatest compensation that will come to you tomorrow, or next year, or the closing year of your life, will be the consciousness that you have somehow been of service, either to your friends, your state or your common country. This is the greatest thing that can happen.

—Warren G. Harding.

Now Has a Quarry Interest

Quarry Foreman: The boss wanted me to take an interest in the business today.

Salesman: He did?

Q. F.: Yes. He said that if I did not take an interest dinged quick, he'd fire me.

"The Poet in a Quarry"

OUR good friend, E. H. McEven, Hannibal, Mo. (don't forget this is the birthplace of Mark Twain), writes: "The enclosed manuscript is self-explanatory. At least I am submitting it with that idea in mind. Here's hoping that you can use it, and that the industry as a whole will be able to survive the shock—Yours truly, etc." We might add that we think the editors have endorsed the next to the last stanza, if not the meter of the verse.

OLD LAND MARKS

In the realm of the quarry, the kiln and mill
A verse may seem strange, I avow,
But the men who were born there and know all the thrills
Will welcome a few verses now.

Oh, it's fine to be Super and run the whole plant,
Persistent, ambitious, all o' that,
But life has its colors, its levels and slants,
Its mountains, its rivers and flats.

So there must be a source of eternal Pep
Somewhere in this game that we play.
No weakling or bluffer or quitter can step
In the place of the Super and stay.

At six o'clock dinner or afternoon tea
He is out of his element, quite,
For he is a product of the stone industry,
A product of brawn and might.

He'd soon lose his bearings in society's glare
Yet his tastes are quite keen, you may bet,
For he tastes when he knows and knows when he tastes
That life is worth while for a' that.

He knows all the voices about the old mill
That tell of her joys and her woes,
There's a kind of a lingo from crusher to kilns
That whispers to those who know.

There's the scent of the greases, the odor of fires,
The click of the buckets and belts,
The thrum of the motors and humming of wires
Is a life that can clearly be felt.

Oh, there's glory in winning a place at the top
And scaling life's ladder of fame,
But there oft comes a time when the winner will stop
And long for old landmarks again.

The love of the action of "Ye olden tyme"
Oft pulls at the leash of his soul
And he longs to step out again into the grime
And music of crushers and rolls.

Oftimes in the office when problems galore
Are piled on his desk to be solved,
The brain becomes weary, his patience gets sore,
For him the old world don't revolve.

So he shoves back his chair and puts on his hat
And walks forth to the places he knows
Where the atmosphere shimmies with the rumble of that
Which thrilled him those long years ago.

And the walk does the trick for when he returns
His face wreathed in smiles most sublime,
Takes up the "Rock Products" and there quickly learns
The short cut to money and time.

'Tis true, I'm no quitter and like to advance,
But I hope that my ladder of fame
Will e'er lead to places where I'll have a chance
To mingle with old haunts again.

They Said It

We Are Rejoiced to Learn that E. J. Krause of the Columbia Quarry Co. heads the entertainment committee at the coming crushed stone convention at St. Louis. This is E. J.'s home city, and he has a profound knowledge of its many attractions. He will be the temporary Haroun-el-Raschid to visiting members who desire to find the Y reading rooms, the nicest movies, or the prettiest walks on a sunny afternoon.

Blue Diamond Materials

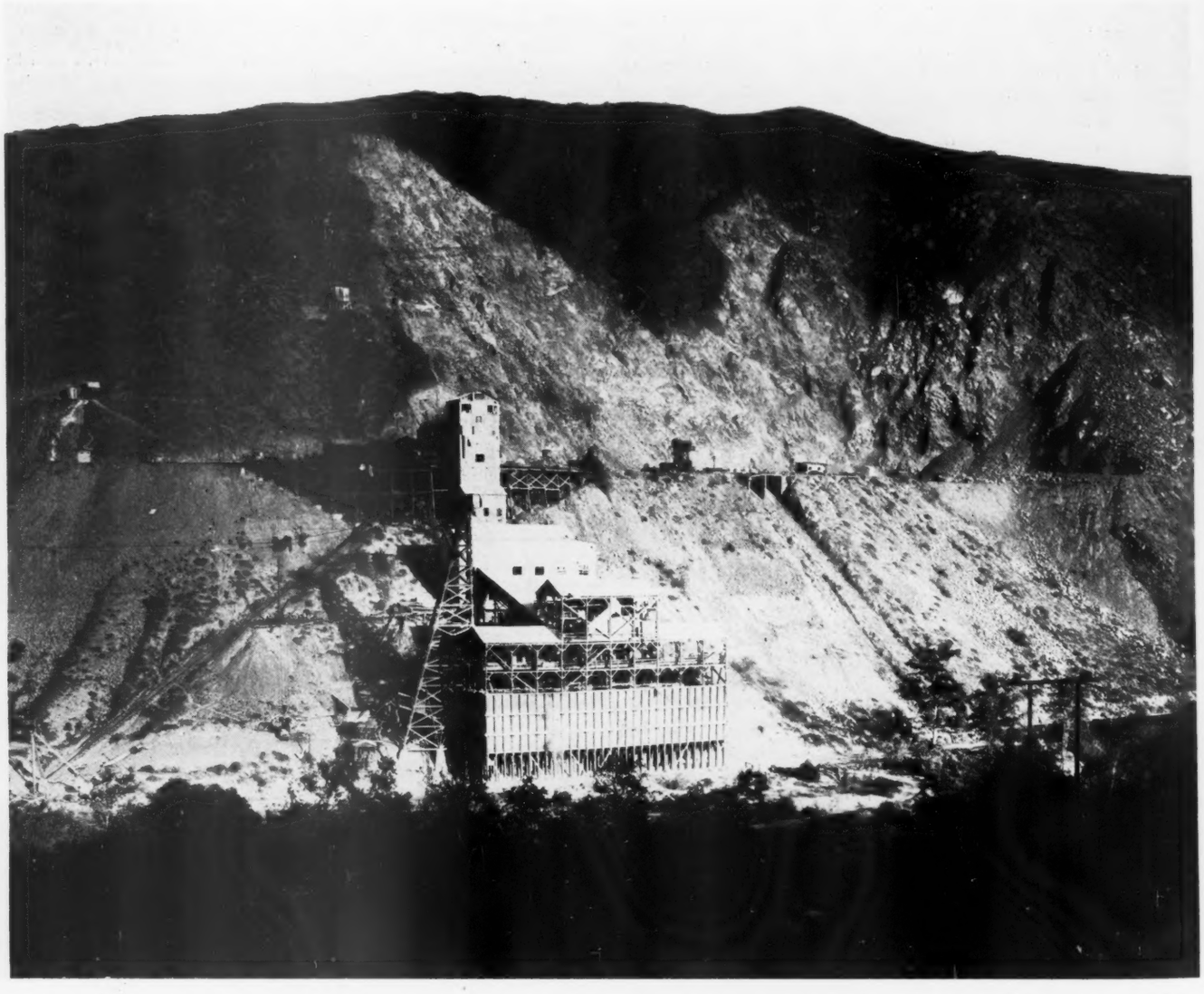
A Remarkable All-Round Rock Products Industry —Realization of the Vision of a Remarkable Man

AN ENTHUSIASTIC business man and a big idea joined forces with a small sum of money in Los Angeles seven years ago. The result of the union today is the Blue Diamond Materials Co., the largest manufacturers, producers, and distributors of basic building materials west of Chicago —and possibly the nearest 100 per cent "rock products industry" under any one organization.

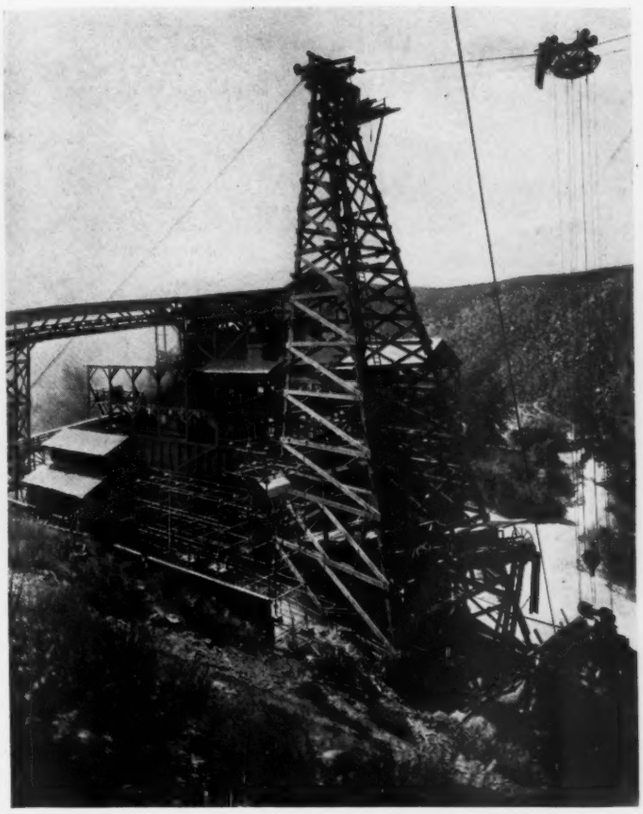
The man was Wm. C. Hay, president and general manager of the company. He started in business with the aid of one old negro helper. The company today comprises 11 major departments and employs more than 600 workers. The idea, with scarcely any further addition of capital other than that earned by the business, has grown into an organization with assets aggregating $4,000,000. The man is too modest to accept the credit so the story must deal with the idea—an idea that converted an undeveloped sand and gravel deposit into a tremendous building materials business.

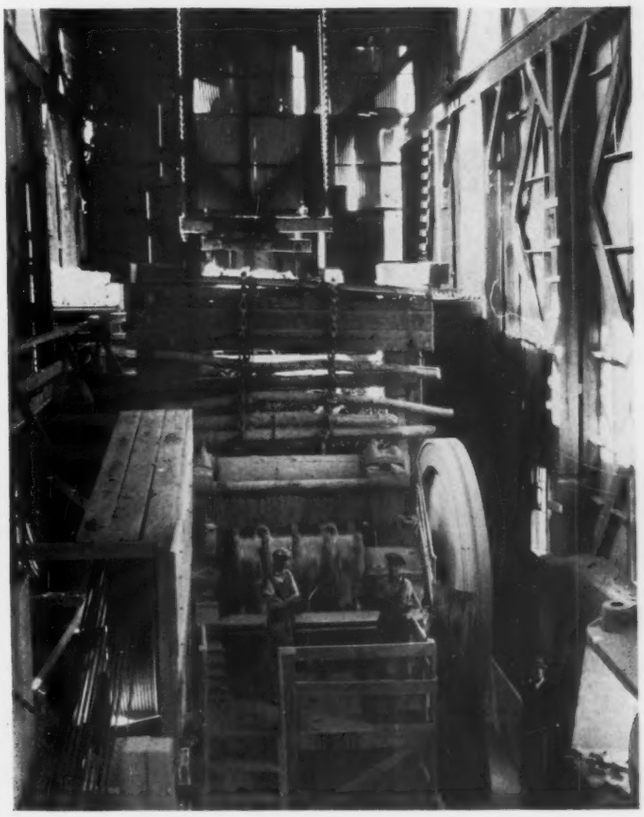
Mr. Hay wondered why lime mortar had for centuries been mixed by hand on the job. He could not see any reason why it should be, in this world of mechanical methods. He started out to prove that it

William C. Hay, whose vision created this most remarkable combination of rock products industries, starting with a small sand and gravel pit

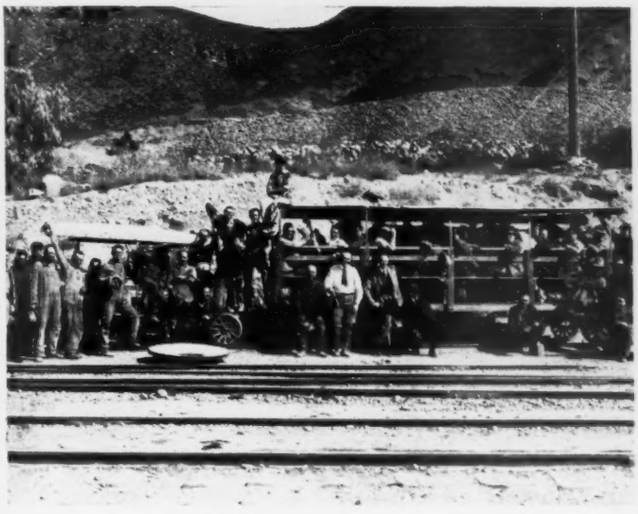


Rock crushing plant of the Blue Diamond Materials Co. The bins hold 6000 tons and there is a ground storage system for storing and recovering 200,000 more. The quarry face is 350 ft. high and 1500 ft. long





Left: The stationary tower of the ground storage system, which is 135 ft. high. The other tower moves on a circular track. Right: View of the 66x84-in. jaw crusher



Left: Part of Champion "night owl" shift with a record of 500 mill cars in 8 hr. The center group in foreground, from left to right is: George Haines, superintendent; F. C. Jones, quarry manager; C. R. Howe, purchasing agent, and John Schreiner, production manager. Right: One of two rock trains pulled by Davenport locomotives, after delivering rock to crusher. These cars are made in the Blue Diamond quarry machine shop

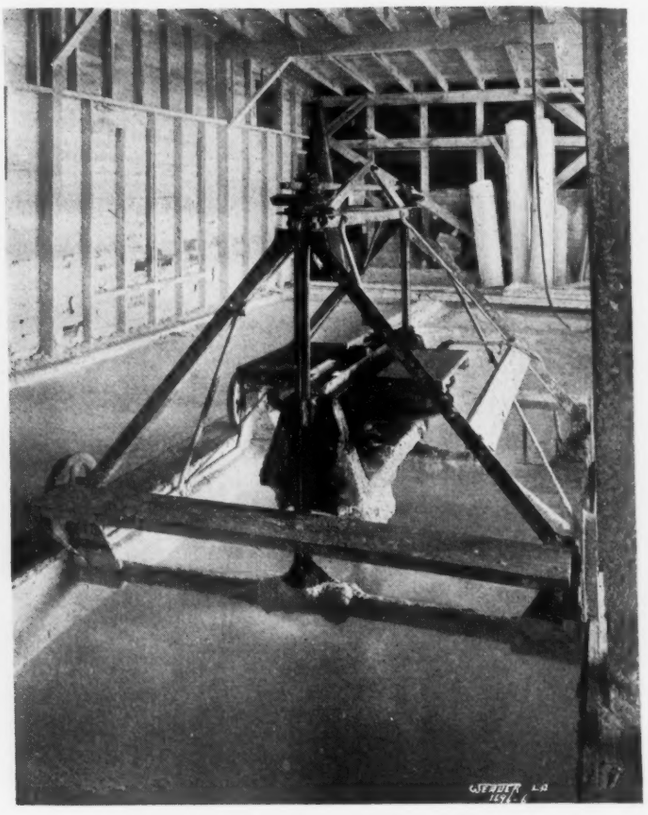
should not. That was the germ of his idea. He proved his theory from both a quality and an economical standpoint and thus his very ordinary idea turned out to be an extraordinary financial success.

An Ordinary Sand and Gravel Deposit Furnished the Start

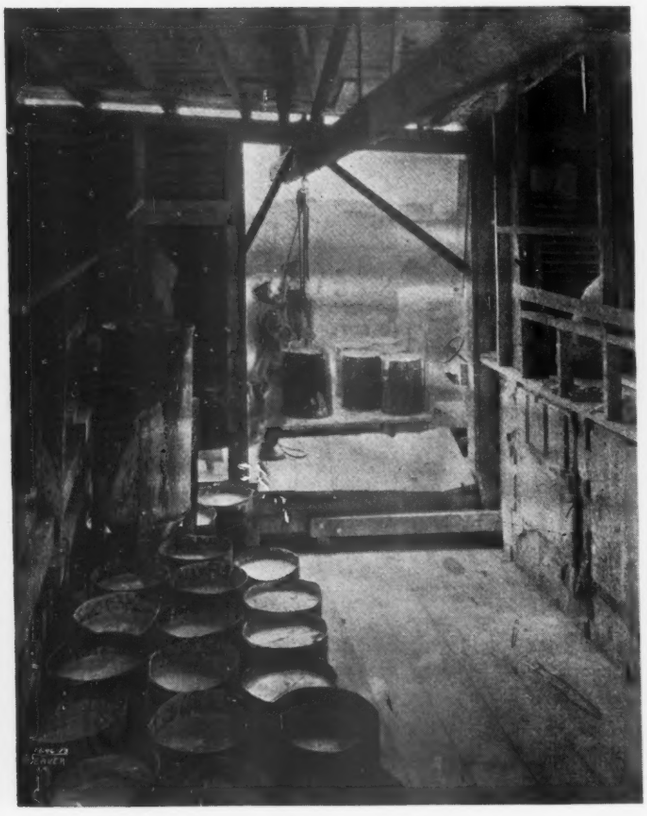
He had a sand deposit under lease that needed developing. But there were a lot of other sand deposits. So the question arose as to how he could sell *his* sand. He knew that sand was the main ingredient of mortar. So he set out to make a superior quality and more economical mortar by the introduction of scientific methods. He produced his product in a central mixing plant and delivered it ready for use by motor truck to the job. He had no trouble in making the kind of mortar he wanted under these conditions and therefore it was easily sold. The sand went with it and thus the little old commonplace sand pit began doing a rushing business.

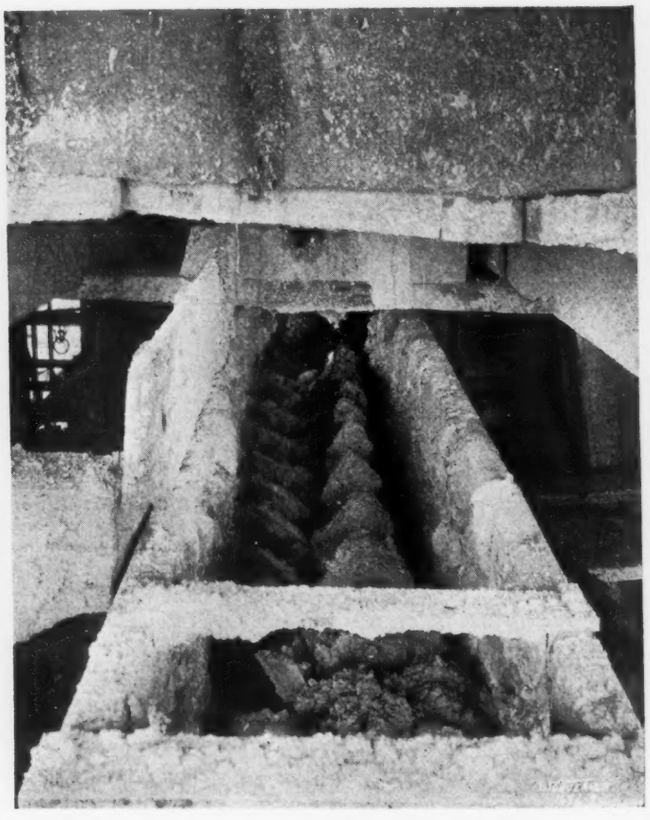
In this manner the "Blue Diamond" mortar process was born. Basic patents on the process have been granted by the United States, Canadian and other governments. Special machinery invented by Mr. Hay is also fully protected by patents. Blue Diamond process mortar plants are now successfully operating in the following cities: Los Angeles, Boston, Cleveland, San Francisco, Oakland, Philadelphia, Atlanta, Fresno, Montreal and Glendale.

Here is a detailed summary of how Blue



Left: End view of lime hydrator showing milk of lime discharging. Right: The agitating gear which agitates and areates the lime and thus improves the plasticity





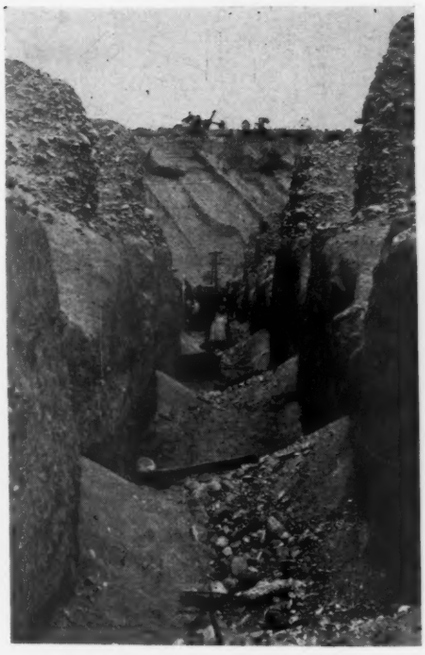
Left: Special aged lime putty is delivered to the job in cans like those shown here. Right: The screw blade mixers in which the sand is thoroughly mixed with the lime

Diamond ready-mixed mortar is made under Mr. Hay's process—the backbone of the idea which turned an inactive, undeveloped sand deposit into a mammoth building materials business of $4,000,000 assets in the brief space of seven years:

The Hay Mixed Mortar Process

The raw lime is slacked in an automatic Hay hydrator having a capacity of 100 tons per day. This machine regulates the volume of water to be used in slaking and discharges a clean flow of rich, creamy, thoroughly slaked putty into storage vats. The putty is allowed to remain in these vats for curing, when agitators, consisting of a portable, motor-driven machine with a large aeroplane propellor on a vertical shaft, revolve in the putty at the rate of 2500 r.p.m. This is known as aeration and lends the virtue of plasticity to ready-mixed mortar to the utmost degree.

From these vats the putty is pumped into large, cylindrical containers on the second floor and from these the putty flows into two screw hoe-blade mixers of special design. Automatic valves measure the exact amount of lime to be added, assuring uniform texture of the mortar at all times. The sand is conveyed to the mixers by two screw sand feeds.



Belt conveyor in a "canyon" at the sand pit, 100 ft. deep

From the mixers the mortar falls into especially built steel hoppers, under which the trucks drive and are loaded by opening a valve.

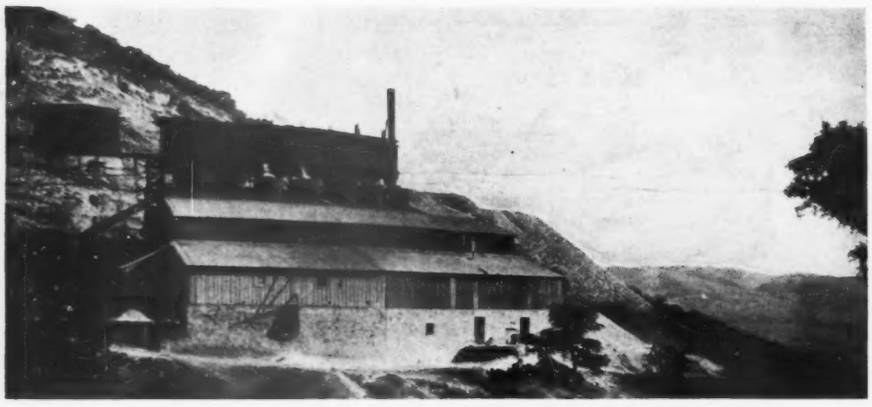
Each vat of putty, containing approximately 1000 cu. yd., is agitated constantly for about two and one-half days. The putty used for plastering is run by gravity from the automatic hydrator into dark, air-tight storage vats, where it is allowed to age for 30 days. At the end of this time the putty is of ideal texture.

The Los Angeles mortar plant of the Blue Diamond company has a daily capacity of 450 cu. yd. There is very little brick work done in Los Angeles by hand-mixed mortar, contractors finding that the ready-mixed product is very much more economical.

Sand and Gravel Plant

Within 10 min. from the heart of the metropolitan business district of Los Angeles the Blue Diamond Materials Co. operates

The big sand and gravel pit of the Blue Diamond is only 10 minutes distant from the hub of Los Angeles. Pit is 1000 ft. long and 600 ft. wide and 2000 yd. of sand and 350 yd. of gravel, both of high grade, are mined from it daily



Blue Diamond lime plant at Tehachapi, Kern county

its sand and gravel plant. This is a naturally clean deposit and the product is marketed without washing. The sand plant has a capacity at present of 2000 cu. yd. of sand and 350 cu. yd. of gravel every 24 hr.

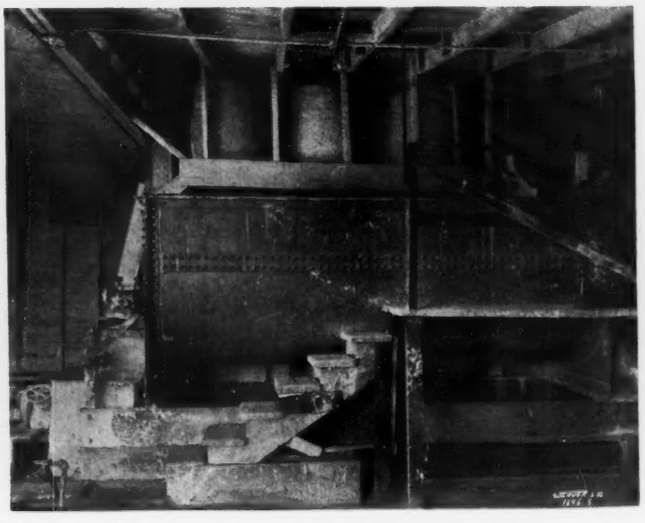
The present workings are 1000 ft. in length by 600 ft. wide. The lowest level reached so far is 100 ft., where water is encountered. The company proposes, however, to pump sand from below the 100-ft. level to another 100-ft. depth, when the present workings above water level are exhausted. Thirty-eight hundred feet of 24-in. American "Crackerjack" belting convey the sand and gravel from the pit. Loading is done by an Osgood No. 29 crawler type steam shovel with 1¼-yd. dipper. Sand is delivered into a conical bin, from which it is fed to a conveyor belt. Four tributary belts converge to one main belt, which carries the material to the crushing and screening plant.

The product from the pit passes over a scalping screen, the oversize going to a No. 4 Gates and a No. 2 Austin gyratory crusher. The trommels used are two 48-in. by 16-ft. and one 36-in. by 12-ft., made by the Power and Mining works of the Worthington Pump and Machinery Corp. Three grades of pit rock are produced—½-in., 1-in. and 1½-in.

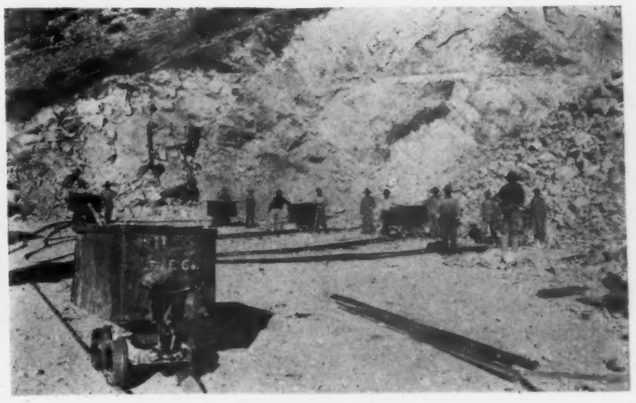
Crushed Stone Plant at Corona

The rock quarry and crushing plant of the Blue Diamond Materials Co., located at Corona, has a daily capacity of approximately 5000 tons in two shifts. The company holdings consist of 1100 acres of high quality porphyry rock, which is mined by the coyote hole system of blasting. The broken rock is handled by a Marion Model 100 steam shovel, with a 4-yd. dipper. A

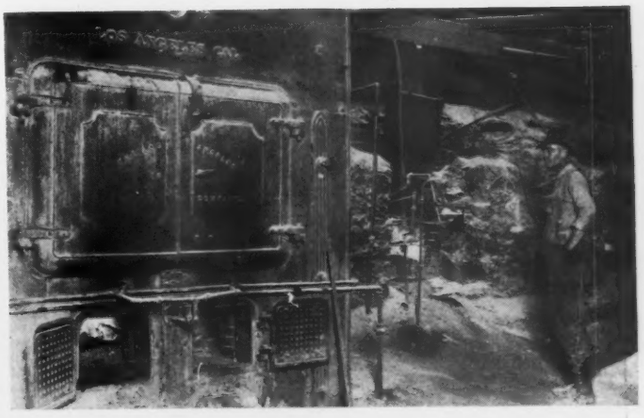
The lime quarry, which is situated in the Tehachapi lime belt, famous for its high calcium limestone. The Monolith Cement Co.'s plant and several other lime plants work the same deposit



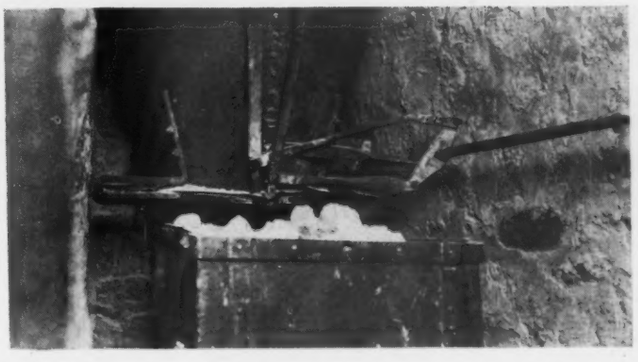
Left: One-half the lime putty plant showing open vats from which putty is pumped to mortar mixing plant. Right: The Hay automatic lime slaking machine from which the freshly slaked lime is run into dark, air-tight vaults where it ages for 30 days



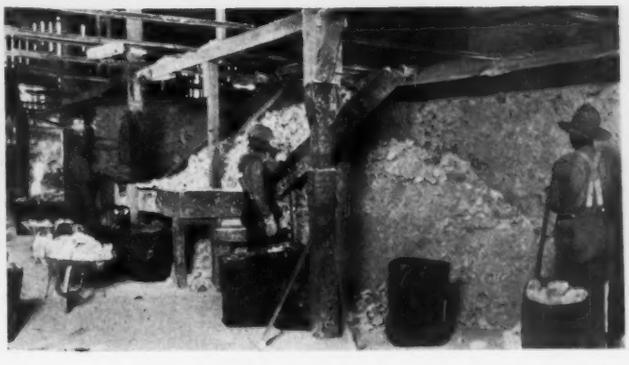
Left: Loading limestone from quarry bins for kilns. Right: Floor of limestone quarry



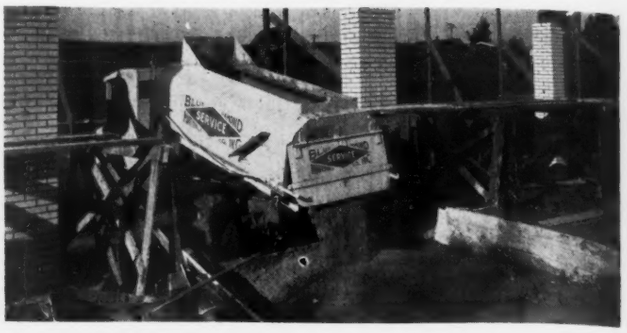
Left: Bottom of quarry incline; dumping limestone to kilns. Right: Front of one of the oil-burning boilers with kiln at right



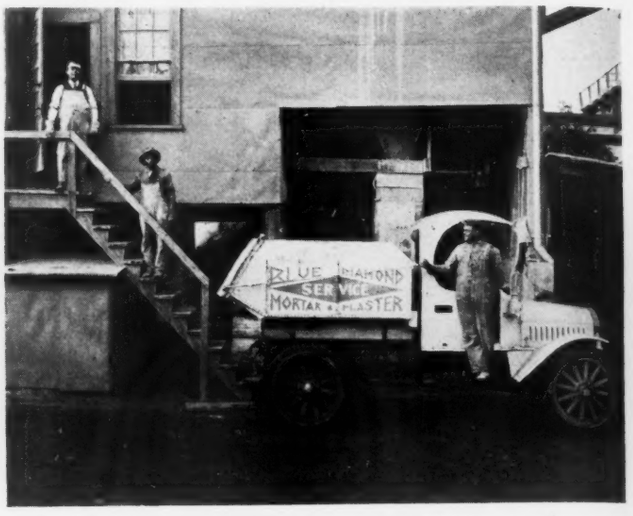
Left: Part of kiln battery showing oil burners. Right: Burned lime being drawn



Left: Burned lime being graded and sorted before shipment. Right: Lump lime loaded into cars



Left: One of the "big boys" in the crushed stone fleet. Each load delivered is certified. Right: A mixed mortar truck delivering its load at the job



Left: This little service truck rushes supplies and mechanics to disabled trucks. Right: Special truck at Atlanta plant

centrally controlled system of electric haulage was used until recently, when this system was replaced by two 16-ton Davenport steam locomotives, each hauling five specially built steel cars, holding 7 tons each.

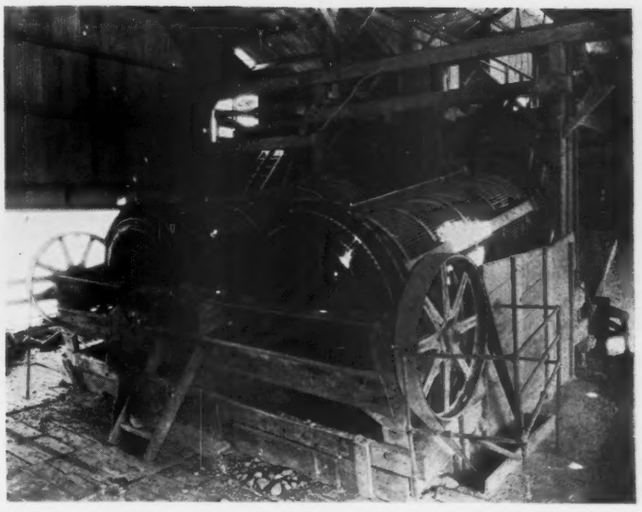
The main crusher consists of a Power and Mining Machinery Works jaw crusher, with a receiving opening of 84x66 in. with manganese steel jaw liners. This crusher can reduce rock to a 10 in. size at the rate of 1000 tons per hour. Secondary crushing is performed by a No. 9 standard McCully gyratory, and the recrushing by three vertical 48-in. and one horizontal 48-in. Simons disc crushers and one 24-in. horizontal Simons disc crusher.

The screening plant originally consisted of two 60 in. by 16 ft. McCully scalping trommels of manganese steel screen sections; one 60 in. by 22 ft. McCully trommel with the following screens: 9 ft. with 1¼-in. perforations, 6 ft. with 2-in. perforations, 6 ft. with 2¾-in. perforations. A dust jacket 8 ft. long and in two sections with ⅜-in. perforations is a part of this trommel. Recently the company has added one 60 in. by 30 ft. McCully trommel, a 60 in. by 24 ft. McCully trommel and a 48 in. by 22 ft. trommel. The total trommels provided for the screening of the present output are all of manganese steel screen, which have proved to be the most economical for this rugged work.

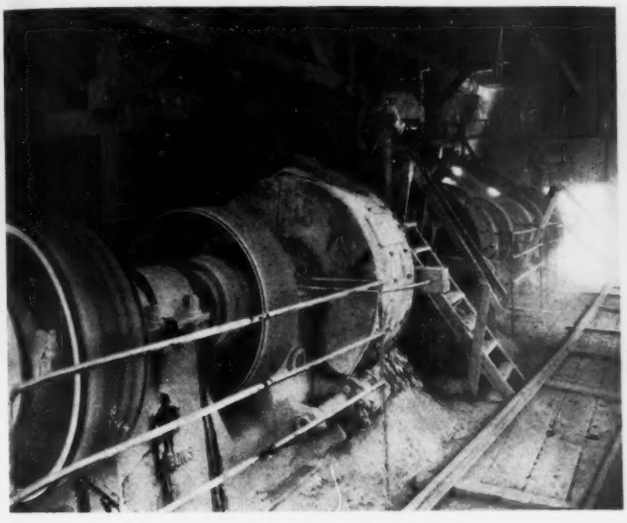
An argument that tied up traffic in the yard. The little one drags the yard streets, the big one switches freight cars

The quarry is equipped with all modern conveniences, a large modern compressor plant and the largest sized Vater water softening plant have been installed recently to insure good water for the boilers. There is a fully equipped machine shop with lathes and all necessary machinery, a complete blacksmith shop capable of handling all heavy work, a large storehouse, track scales, powder magazine. The plant has five miles of private railroad of 75-lb. rail standard construction railroad, the yard being on a true one per cent grade, making it fine for gravity switching.

The entire plant is electrically equipped and has a ground storage capacity of 200,000 tons. The storage bins hold approximately 6,000 tons. The ground storage system consists of two towers, each 135 ft.



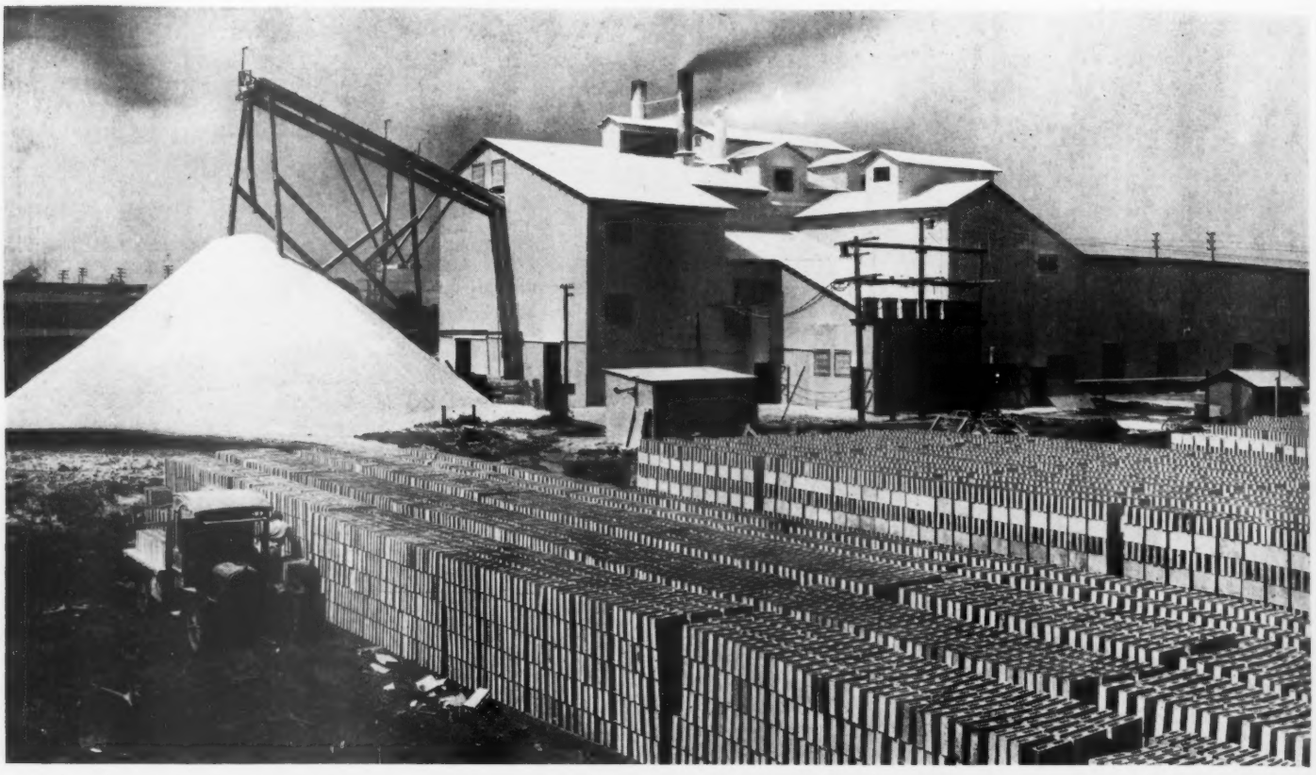
Left: End car of train dropping 7½ tons of rock into mouth of big jaw crusher. Right: The primary scalping screens



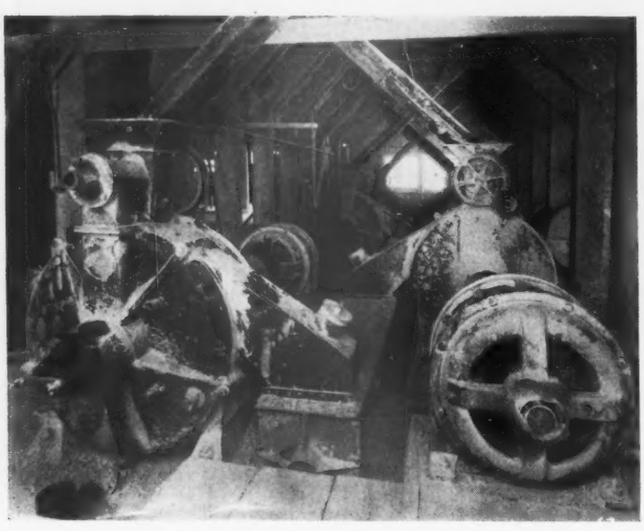
Left: A battery of Simons disk crushers. Right: The sorting screens which are above the loading bins

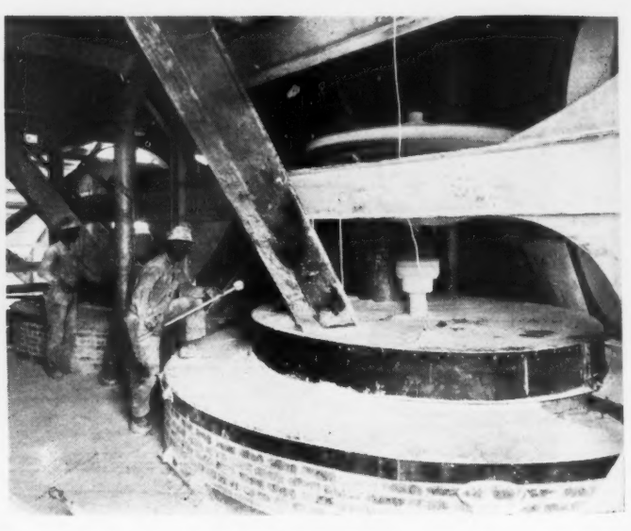
Model 100 Marion steam shovel loading rock train on floor of the quarry above the Blue Diamond crushing plant

Finger gate to regulate feed to No. 9 McCully gyratory crusher



The new Blue Diamond plaster mill. Auxiliary storage of ground gypsum is shown at the left. In the foreground gypsum partition blocks are drying





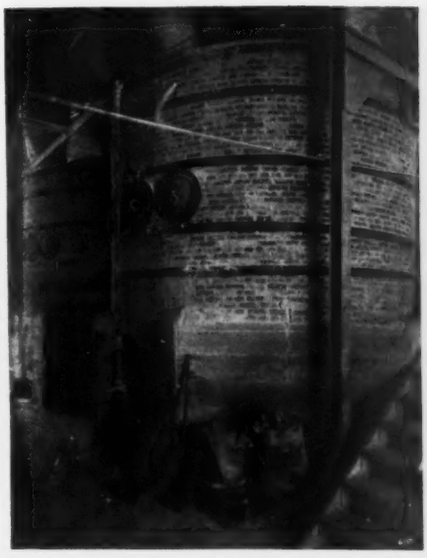
Left: One of the two batteries of vertical buhr mills that grind the raw gypsum before calcining. Right: Top of calcining kettles. Note the wires that run from each kettle to recording thermometers

high, one being a movable tower operating on an 800-ft. radius. The span is 800 ft. and carries a 2½ cu. yd. bucket of the Hayward type, running 1250 ft. per minute, running on a 2½-in. lock strand cable. A description of this storage plant was published in Rock Products, March 10, 1923.

Preparations are now being made to send off the largest shot that has ever been made on the American continent, some time during this month of January, 1924. The shot will contain nearly 150 tons of powder and is intended to throw down approximately 2,000,000 tons of rock at one time. The handling of the powder for this shot is under the supervision of J. C. Cushing, technical representative of the Hercules Powder Co. The company expects to effect a powder cost of about 1½c per ton on this shot.

The working face of the quarry is 1500 ft. long and about 350 ft. high.

The crushing plant is equipped with two units of the Sly dust-collecting apparatus, consisting of two type A units, with 3000 sq. ft. of cloth screen area, using 10,000 cu. ft. of air per minute each and collecting one and a half tons of dust per hour. In this installation a housing around certain of the trommels permits the abstraction of dust by suction. Special cycloidal exhaust fans are used, the vanes or blades of which are set at an angle to the shaft. The dust-laden air passes into a settling chamber, the coarser particles being diverted downward by a baffle. A cloth filter is used to collect the fine dust, an exceedingly large surficial area being arranged in a small space. The deposited material falls into conical bins, equipped with valves at the apices, the freeing of the dust from the surface of the cloth being insured by stop-



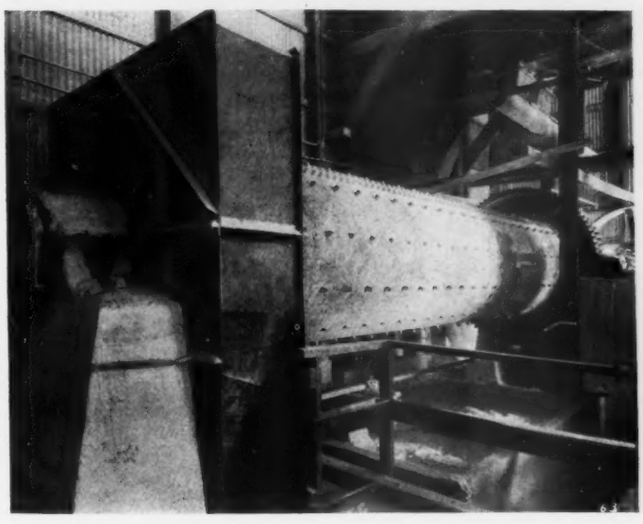
Calcining kettles. The fuel is oil, insuring positive and uniform temperature

Compressed air replaces hand work in resurfacing buhr stone at this plant

modern mills of its kind in the West and is located on the company's 33-acre tract within ten minutes of the heart of the business district of Los Angeles.

The mill has a capacity of 250 tons per 24 hr. The raw gypsum, which is brought to Los Angeles from Imperial Valley in El Centro County, is unloaded by means of bucket elevators and conveyor belts into three 140-ton bins. From these bins the raw gypsum gravitates to a battery of eight Ersham vertical buhr mills. The gypsum is ground in these mills so that a high percentage passes a 100-mesh screen. Leaving the buhr mills, the ground gypsum powder is conveyed by screw conveyors to another 140-ton bin, from which it feeds by gravity to two oil burning calcining kettles, also built by the Ehrsam company.

The bottom of these calcining kettles is of cast-iron over a masonry fire box, so constructed that an air space is left between the walls and the sides of the kettles. The



Left: Allis-Chalmers 5x22-ft. tube mill, with manganese liners and steel balls used in grinding the calcined gypsum. Right: One of the two Bates valve bag packers

ping the suction for ten minutes every four hours or so, to allow operation of a tapping device, which jars the screen surface. The dust from the Sly plant is marketable for asphalt filler, and mineral filler for other purposes, and is sacked for shipment.

The plant includes a machine shop fully equipped with lathes and all the machinery necessary to make ordinary repairs and do maintenance work. A well equipped blacksmith shop is capable of handling heavy work. There are also a large storage house, track scales and a powder magazine capable of holding 100,000 lbs. of powder.

The Corona plant was built by John Schreiner, production manager of the Blue Diamond Materials Co., and is under the supervision of George Haines, who assisted Mr. Schreiner in the initial construction work. F. C. Jones has charge of the office.

The Blue Diamond gypsum plaster mill is the largest of the only two plaster manufacturing plants in the entire state of California. This plant is one of the most

hot air and gases pass completely around the kettle across flues extending from side to side and thence to the stack. Large rotating paddles penetrating into the kettles

One of the two laboratories in which samples of every batch of mortar and plaster are tested, and in which materials are constantly investigated

An Airplane Photograph Showing Blue

The big sand and gravel pit is shown in the center of the picture. Some idea of the scale of the picture may be gained by remembering that Sixteenth street and Santa Fe avenue. The sand and gravel bins are on Sixteenth street at left of pit and back of these is the plaster plant with It is interesting to the sand and gravel operator to note the great depth to which

g Blue Diamond Sand Pit and Buildings

embering that the pit is 1000 ft. long. The pit is near the heart of Los Angeles, the street intersection in the upper left-hand corner being that of ter plant with stock piles between it and the pit. The gypsum plant is located on a point just beyond the lower right-hand corner of the picture. th to which excavations may be carried in this dry region without encountering water

keep the gypsum in constant agitation for about three hours during the process of calcination.

From the kettles the finished plaster passes in a bucket elevator to an overhead storage bin. From this point it is fed by gravity into a 60-in. by 22-ft. Allis-Chalmers tube mill, equipped with manganese steel liners. Steel balls 1¼ in. in diameter are used. The plaster is then carried by conveyor belt and bucket elevators to additional storage bins, from which it is drawn by gravity into a battery of two 3-sack Bates valve-bag sackers. The output of the mill can be sacked at the rate of six 100-lb. bags per minute.

Lime Plant

The Blue Diamond lime plant is located at Summit switch, three miles east of Tehachapi, Kern County, on the Southern Pacific railroad. The plant consists of seven upright kilns, a lime house holding two thousand tons with the necessary tanks and piping to make a complete lime burning outfit. The quarries are located about 500 ft. above the kilns, rock being lowered from the quarry by tramway, 700 ft. long, operating on a 70 per cent grade. The limestone is of unusual fine quality, running around 99 per cent calcium carbonate.

A thoroughly up-to-date mess house with a competent chef and assistants is maintained in addition to comfortable living quarters for the men.

The kilns produce about 7 tons each per 24-hr. run. The total output of the plant is about 50 tons per 24 hours.

City Service Department

The keynote of Mr. Hay's attitude as a business man is to sell SERVICE as well as materials. He believes in a producer-to-consumer policy. He intends eventually to produce and retail other basic building materials. He is a good advertiser. His "blue diamond" trademark is one of the most familiar things in Los Angeles. It appears in newspaper advertisements, on signs, on white motor trucks of special design. He has made his business an institution.

A "Good Fellow" at Home as Well as in Company

EVERYBODY in the lime industry knows and loves George B. Wood, president of the Rockland and Rockport Lime Corp. He is a prince of good fellows in every best meaning of the term—big-hearted, generous, kindly, sympathetic; both open- and fair-minded. To be made president of the National Lime Association is a real distinction not fully appreciated by the uninitiated, but thoroughly understood by lime manufacturers. And George B. Wood is president of the National Lime Association by unanimous consent.

Now, as every man knows, it is easier to be a good fellow in public and at conventions than in your own home town and in your own plant. George B. Wood is a good fellow among his employes, as well as among his brother lime manufacturers—if the following newspaper reports from Maine are to be relied upon; and every man who knows George B. Wood will doubt if they really do him justice:

The finest demonstration of industrial harmony ever witnessed in this city was the banquet and smoker tendered by the Rockland and Rockport Lime Corp. last night to nearly 400 of its employes. So large was the gathering that the banquet took the form of a double header, the bulk of the guests being served by the Eastern Star in Temple hall, and the remainder by the Sons of Veterans Auxiliary at Grand Army hall. Everett Libby, safety engineer, acted as master of ceremonies, and under his skillful direction there was not a dull moment from the time the corporation's sturdy workmen assembled at the respective halls until they finally adjourned with rousing cheers for the man who is at the forefront of the lime industry in Knox county, George B. Wood. The president of the Rockland and Rockport Lime Corp. was the recipient of a remarkable ovation, about which there was a sincerity and spontaneity that told, more than words, how this captain of industry stands with relation to the toilers.

The outgrowth of last night's smoker will be a mutual benefit association formed and managed by the employes, with the corporation's friendly assistance. By unanimous vote of the meeting President Wood was directed to select a committee which will prepare the ways for the launching of the new movement. The makeup of committee will be duly announced.

Among the special guests at the smoker were Howard I. Siegrist and John F. Anderson, representing the Hartford Accident and Indemnity Co., with which the lime corporation carries the insurance protecting its workmen.

* * * *

The audience sang "America" as a prelude to the after-dinner exercises, everybody rising. It was a cosmopolitan gathering, but all were Americans, comrades and brothers.

The appearance of President George B. Wood, head of the corporation, brought down the house, and the whole-hearted applause of the employes bespoke their regard for their "boss."

"That's fine," said Mr. Wood, his face wreathed in smiles, after listening to the prolonged applause which greeted him.

"This is no time for speeches or lectures," began Mr. Wood, "and I simply want to say that the company we are all working for welcomes us here to have a good time, and I hope we shall have more of these gatherings.

"It used to be said that a corporation had neither heart nor soul, but a big corporation can give a square deal as well as the small fellow and can do it better. Some of it may look like red tape—Mr. Libby's department, for instance, but it is necessary to have system. It is true that a boss cannot know every mother's son who works for him, but in this case he knows more of you than perhaps you realize.

"I have never yet seen a lime plant that is an especially clean and tidy place to work in, but we have improved in many ways, and are going to continue to make working conditions better for our men whenever we can. Of course there is room for improvement in our plant, but there were places two years ago that were a whole lot dirtier than they are today. The safety and welfare committee is going to continue its work and hopes to have things better.

"There is one thing that the corporation hasn't got around to yet, and that is the care of the employes when they are sick and unable to work. The compensation law does not help them any, and I believe that you can form a mutual benefit organization with small dues, so that there will be funds to help disabled workmen and their families in times of need. The company will be glad to aid you in its formation, but believes that it should be strictly your own proposition. You men can have an organization that can handle such conditions and which can have more shows like this. It ought to be done. Organize your own mutual benefit association. It doesn't take a great deal for dues, perhaps as little as 25 cents a month, and your own committee attends to the allotment of benefits. I would suggest that a committee be appointed to stage the thing. This committee's first duty would be to get a list of charter members, after which a meeting would be called and officers elected. The treasury may be a little bare at times, but you can get John Dan Shepherd to start a minstrel show and raise funds somehow."

Mr. Wood then said it was the company's intention to put up a new building at the Northend to contain a dispensary, lockers, etc., on the ground floor, with a hall on the second floor where the men can eat their lunches and hold their meetings.

Mr. Anderson was introduced as an expert on safety matters. He said that many recommendations had been put before the safety and welfare committee, and those which seemed worth while had been carried out. "President Wood has given me great co-operation," said the speaker, "and your working conditions in every respect have been improved. Some of our suggestions may look foolish or petty, but experience has proved that the hazards have caused many accidents. Whatever is done is done for the betterment of the employes of the Rockland and Rockport Lime Corp.

* * * *

This get-together is the first thing of its kind that the lime company has held, and its obvious popularity with the men, backed by the idea of a permanent organization for mutual benefits, will undoubtedly lead to many more such get-togethers.

We have left out entertainment features. But we believe the rest speaks for itself.

Strength of Limestone in Tension

TENSION tests on samples of Indiana limestone recently made at the Bureau of Standards, in connection with the design of lifting devices for hoisting large blocks of stone, showed values ranging from 300 to 715 lbs. with an average of 535 lbs. per square inch. By way of comparison, it may be mentioned that the tensile strength of American portland cement (neat) varies from almost 600 lbs. at 7 days to 800 lbs. at 4 months, according to the Philadelphia tests of 1899.

Editorial Comment

Cubic Yards and Tons

There is a queer kink in our mental processes which makes us hesitate to falsify figures which we know are correct, but which does not hesitate to change an estimate or a guess to a little more or less than our best judgment tells us it should be. And in that twist lies all the psychology of the argument for selling sand, gravel or crushed stone by the ton instead of by the cubic yard. The weigh-clerk who sees the figures plainly on the beam of the balance will set them down on the ticket, and the buyer will get just what he pays for, neither more nor less. If the clerk is selling by the cubic yard he will see that the customer whom he likes gets enough to be satisfied, while the other fellow is cut down to the exact measurement, or perhaps a little less. Where competition is keen, the estimating may be arranged to favor customers whose trade it is especially important to hold. This sort of thing belongs to an era that is fast passing in our business life, the era of secret rebates, petty graft and unfair competition. The new system is to base competition on quality and service and stand or fall by the result. And the increase in the number of plants that sell aggregate by the ton instead of by the yard is gratifying evidence that it is this new system rather than the old that the rock products industries are adopting.

Imitation Is Sincere Flattery

Rock Products' editors frequently have the genuine satisfaction of seeing its contemporaries copy their articles—even to the exact reproduction of drawings prepared by our own draftsmen. There is no law against such piracy—except the rules of editorial ethics, to which some of our contemporaries evidently do not subscribe—and so long as Rock Products publishes such articles *first*, we feel rather flattered than otherwise by their subsequent reproduction.

However, when a Rock Products' article appears in one of these contemporaries simultaneously with its publication in Rock Products we would not be doing our readers justice if we did not offer some explanation, because we ask and exact a subscription price, while the contemporary referred to comes to their offices unsolicited.

Rock Products naturally feels a *direct obligation* to its subscribers to render a return for the subscription price. Consequently we are guided in our editorial judgment by what we believe our *readers* will profit by. When we want a description of a particular plant we go after it. We probably travel, in the aggregate, 50,000 to 60,000 miles a year on such business. We are trying to serve our readers in a legitimate, helpful, cooperative way—combining our experience in observation and reporting with theirs in operation.

Consequently when a Rock Products' article describing a new Eastern lime plant does appear in a contemporary publication simultaneously and the data used in the article is that gathered by one of Rock Products editors on one of three special trips made to visit the plant, we can't help pointing out to our readers that the Rock Products' article *is not press-agent stuff*, as the circumstances would make it appear, but is the result of a bona fide investigation of the plant—the same as our other articles.

Our contemporary has been guilty of what in the publishing business is considered a very contemptible trick—of obtaining an advance proof of our article sent in confidence to a third party, and of using the article so obtained without the permission of any one concerned. The chief satisfaction in this case is that the article so stolen contains errors, which, with the cooperation of the proprietors of the plant in question, Rock Products corrected before publication in our December 29 issue.

State Owned Cement Plants

Michigan has leased a cement plant which it will operate with convict labor. South Dakota has a state plant approaching completion. Other states are proposing to build plants, or rather the politicians, who find this an easy way to assure the people that they are looking after their best interests, are proposing that the states should build such plants. As the sand and gravel and crushed stone industries are confronted all the time with the competition of gravel pits and stone quarries operated by counties and municipalities, this matter is of interest to the whole rock products industry. The principle on which these plants are built is that it is a good thing for the state to make whatever it requires and do away with the profits of private operation. If the principle is good, why not carry it farther? Henry Ford and other investigators have shown how, by the use of power driven machinery and the cultivation of large acreages, wheat may be raised at a cost considerably below what it now sells for. Therefore let us have large, state-owned wheat farms, on which cheap food may be raised for the inhabitants of the towns. The wheat will be produced all the cheaper if we can employ unpaid convict labor to do the work, and it will be much better for the health of the convicts if they are to work on farms instead of in the heat and dust of cement plants. This sounds absurd, but it is really not more absurd than the establishment of county pits and quarries and state-owned cement plants.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert,
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning December 26:

Central Freight Association

7630. Slag, Detroit, West Detroit, Ecorse and Wyandotte, Mich., to Michigan. Present and proposed—Exhibit "A" attached hereto.

7648. Sand, Gravel and Crushed Stone, Kenneth and Lake Ciecott, Ind., to Bunker Hill and Kokomo, Ind. (in cents per net ton):

	Present	Proposed
From Kenneth, Ind., to Bunker Hill, Ind., commodity, sand, gravel and crushed stone	75	70
From Lake Ciecott, Ind., to Bunker Hill, Ind., sand and gravel	75	70
From Kenneth, Ind., to Kokomo, Ind., sand, gravel and crushed stone	76	70
From Lake Ciecott, Ind., to Kokomo, Ind., sand and gravel	76	70

7649. Sand, Gravel and Crushed Stone, Kenneth and Lake Ciecott, Ind., to Lebanon, Colfax and Herr, Ind. (in cents per net ton):

	Present	Proposed
From Kenneth, Ind., to Colfax, Ind., sand, gravel and crushed stone	95	75
From Lake Ciecott, Ind., to Colfax, Ind., sand and gravel	95	75
From Kenneth, Ind., to Lebanon, Ind., sand and gravel	88	75
From Kenneth, Ind., to Lebanon, Ind., crushed stone	95	75
From Lake Ciecott, Ind., to Lebanon, Ind., sand and gravel	88	75
From Kenneth, Ind., to Herr, Ind., sand, gravel and crushed stone	100	75
From Lake Ciecott, Ind., to Herr, Ind., sand and gravel	100	75

7659. Ashes, Cinders (except mill cinder and pyrites ore cinder) and Slag, Cleveland, Toledo and South Lorain, Ohio, to Ohio points (rates in cents per 2000 lb.):

From	Present	Proposed
Cleveland, O., to Oak Harbor, O.	100	90
Toledo, O., to New London, O.	110	100
Toledo, O., to Ridgeway, O.	110	100
Toledo, O., to Wellington, O.	110	100
South Lorain, O., to Bedford, O.	80	60
South Lorain, O., to Beach City, O.	110	100
South Lorain, O., to Mt. Gilead, O.	100	90

Exhibit "A"

Applying on: Slag; Slag, Furnace; Slag, Furnace, Crushed; from Detroit, Ecorse, West Detroit and Wyandotte, Mich. (in cents per ton of 2000 lb.):

To	Proposed state and interstate	Present Rate	Present interstate
Albion, Mich.	95	95	126
Allegan, Mich.	125	125	.....
Bridgewater, Mich.	87	87	.....
Brooklyn, Mich.	97	97	.....
Cement City, Mich.	97	97	.....
Eaton Rapids, Mich.	95	95	126
Grand Rapids, Mich.	115	115	202
Homer, Mich.	95	95	126
Jackson, Mich.	90	90	113
Jerome, Mich.	102	102	.....
Kalamazoo, Mich.	110	110	164
Lansing, Mich.	95	95	126
Manchester, Mich.	92	92	.....
Monroe, Mich.	70	70	63
Plainwell, Mich.	127	127	.....
Saline, Mich.	87	87	.....
Schoolcraft, Mich.	127	127	.....
Sibley, Mich.	54	54	.....
Wyandotte, Mich.	54*	54*	63*

*Rate will not apply from Wyandotte.

7666. Crushed Stone, France Quarries, Ohio, to Green Springs, Ohio. Present, 80 cents per net ton; proposed, 70 cents per net ton.

7669. Crushed Stone, in bulk, in open cars, Middlepoint, Ohio, to Sturgis, Kalamazoo, Wasepi and Vicksburg, Mich. Present, 6th class rate. Proposed, $1 per net ton to Sturgis and $1.10 per net ton to other destinations.

7670. Sand and Gravel, Merom and Riverton, Ind., and Palestine, Ill., to C. M. & St. P. R. R. in Indiana. Present, 6th class; proposed:

To	Rate
Vicksburg, Ind.	92
Midland, Ind.	97
Jasonville, Ind.	97
Coalmont, Ind.	97
Lewis, Ind.	102
Black Hawk, Ind.	102
Hymera, Ind.	102
Glendora, Ind.	102
Odon, Ind.	102
Bedford, Ind.	117

7676. Crushed Stone and Stone Screenings, Branchton and Osbornes, Pa., to Electra, Pa. Present, $1.75 per net ton; proposed, $1.51 per net ton.

7687. Sand and Gravel, Miamiville, Ohio, to Bloomingburg, Madison, Mills, Cooks, Mt. Sterling, Era and Derby, Ohio. Present, 15 cents all points except Era, and Derby, 16 cents; proposed, 95 cents per net ton to all points except Derby, $1.05 per net ton.

Illinois Freight Association

2236. Molding Sand, C. L., minimum weight 90 per cent of marked capacity of car, $1 per net ton from Dallas City and Lomax, Ill., to Keokuk, Iowa.

2217. Sand, Gravel and Crushed Stone, C. L., minimum weight 90 per cent of marked capacity of car, $1.13 per net ton from Joliet, Ill., to Topeka, Ill.

2242. Stone, broken, crushed or ground, stone quarry strippings, carloads, minimum weight 90 per cent of marked capacity of car, 6 cents per 100 lb. from Waukesha, Wis., to Joliet, Ill.

2252. Sand and Gravel, carloads, minimum weight marked capacity of car, $1.15 per net ton from Coleman, Ill., to LaHogue and Piper City, Ill.

2260. Crushed Stone, carloads, minimum weight capacity of car, $1.15 per net ton from Hillside, Ill., to LaHogue and Piper City, Ill.

New England Freight Association

5656. Molding Sand, from Elnora, Reynolds, Schaghticoke, Schuylerville (Cramer's Bridge, Schuyler Junction, Stafford Bridge), Scotia, Saratoga Springs, Stillwater, Wayville, Mechanicville and Ushers, N. Y., to Nunda, N. Y., 16½ cents. Reason: To permit movement of traffic.

5700. Stone, broken or crushed, in bulk in gondola or other open cars, from Branford, East Berlin, East Haven, East Wallingford, Meriden and Rocky Hill, Conn., to Harbor Junction Wharf and South Providence, R. I., $1 per net ton. Reason: To equalize the rates to Providence proper.

Southern Freight Association

12052. Crushed Stone, C. L., from Roanoke, Va., and Blue Ridge, Va., to Wilford and Edwards, N. C. Present rate, 11 cents per 100 lb.; proposed, to Wilford, 176 cents; to Edwards, 180 cents per net ton. Proposed rates based on scale (for the distance from Roanoke) submitted by the carriers to the Alabama and Georgia Public Service Commission, less 10 per cent.

12059. Gravel, C. L., from Camden, Tenn., to Dyersburg, Tenn. (Interstate). Present rate, 113 cents per net ton; proposed, 100 cents per net ton, based 10 cents per ton higher than applicable from Gravel Switch, Ky.

12070. Cement, C. L., from Birmingham, Ala., and Group, Leeds, Ala., and Ragland, Ala., to Emrey Gap, Harriman and Knoxville, Tenn. It is proposed to advance present rate of 16 cents from Birmingham and Group, Leeds and Ragland, Ala., to Knoxville, Tenn., to 17 cents per 100 lb., made on basis of average distance from the origin points named to Knoxville, applying in connection herewith the mileage scale which carriers are considering in connection with general revision of rates on cement between Southeastern points. To Emrey Gap and Harriman, Tenn., it is proposed to reduce present rates of 18 cents from Birmingham, Ala., and Group and Leeds, Ala., to 17 cents per 100 lb., or the same as proposed to Knoxville. It is also proposed to advance present rate of 16 cents from Ragland to Emrey Gap and Harriman to basis of 17 cents, or the same as proposed to Knoxville, Tenn.

12086. Stone, crushed or rubble, C. L., minimum weight 40,000 lb., from Spring Hope, N. C., to Cape Charles, Va. Present rate, 45 cents per 100 lb (Class A); proposed, 420 cents per net ton, made on Norfolk, Va., combination, using crushed stone, rate to Norfolk, plus specific proportion of Pennsylvania R. R. beyond.

12087. Cement, C. L., from Richard City, Tenn., to York, Ala. Present rate, 24 cents; proposed, 19 cents per 100 lb., made not higher than rate to Meridian, Miss. Proposed rate will have the effect of removing existing Fourth Section violations.

12148. Crushed Stone and Ground or Pulverized Limestone, C. L., from Ladds, Ga., to Britton, S. C., Dalzell, N. C., and Maisville. No commodity rates now in effect. Proposed, 237 cents per net ton, same as present rates on ground or pulverized limestone, from Mascott, Tenn. Also same as rate proposed on ground or pulverized limestone, Whitestone, Ga., in Submittal No. 11301.

12174. Cement, C. L., from Leeds and Ragland, Ala., to Asbury, Ala (interstate only). Present rate: From Leeds, 371; from Ragland, 383 cents per net ton. Proposed rates from both points, 333 cents per net ton, same as present rate in effect from Birmingham and Boyles, Ala.

Southwestern Freight Bureau

10242. Lime. To establish rates on lime, C. L., from Johnsons, Ark., to stations on the M. K. T. R. R. in Oklahoma on basis of 1½ cents per 100 lb. under rate published from the Ash Grove-Springfield district. Remarks: The purpose of this proposal is to establish rates to M. K. T. R. R. points named on differential of 1½ cents per 100 lb. under rates published from Ash Grove-Springfield district, which is claimed proper, difference in distance considered.

10299. Molding Sand. To amend Item 4394, S. W. L. Trf. 15-1, applying from points in Illinois to points in Oklahoma, to provide for the addition of molding sand, C. L., at the same rate and minimum weight as at present applicable on glass sand, C. L., shown in the item. Remarks: It is claimed that the price of glass sand is in excess of that on molding sand, and that the rate on the lower grade commodity should not exceed the rate applicable on the higher grade commodity.

10308. Cement. To establish the following rates in cents per 100 lb. on cement, C. L., as described in S. W. L. Trf. No. 90E, minimum weight 60,000 lb., from Kansas producing to stations in Louisiana on Southern Pacific Lines shown below.

Stations.	Proposed basis
Louisiana Western R. R.	
Scott to Duson, Indices 5765 to 5775	$.33
Rayne to Crowley, Indices 5780 to 5785	.33
Tortue to Estherwood, Indices 5790 to 5795	.33
Midland Index 5800	.33
Maignaud to Rupert, Inc. Indices 5855 to 5885	.33
Eunice Index 5890	.33
Mermentau Index 5915	.33
Jennings Index 5920	.33
Roanoke to Chloe, Indices 5925 to 5950	.33
Mallard Junction Index 5955	.33
Sulphur to Toomey, Indices 6020 to 6040	.33
Morgan's Louisiana & Texas R. R.	
Shadyside to New Iberia, Indices 10855 to 10935	.34
Independence Sw. to Lafayette, Sugar Refinery Co. Indices 10940 to 10990	.34
Lafayette, Index 10995	.33
Torian to Veltin, Indices 11575 to 11625	.33
Opelousas, Index 11630	.33

Remarks: The proposed rates are those in effect to competitive points in Louisiana on other lines and it is desired to line up these rates to meet competition. It is necessary to reduce the rates to the local intermediate points in order to clear the Fourth Section.

Trunk Line Association

11795. Cement, common, hydraulic, natural or portland, C. L., minimum weight 50,000 lb., Portland Point, N. Y., to Washington, D. C., 18 cents per 100 lb.

Western Trunk Line

3448A. Sand, carloads, from Millington, Oregon, Ottawa, Sheridan, Utica and Wedron, Ill., to Salem, Ohio. Present rate, $3.53 per net ton. Proposed, $3.40 per net ton. Minimum weight 90 per cent of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply.

3448B. Sand, C. L., from Millington, Oregon, Ottawa, Sheridan, Utica and Wedron, Ill., to Loogootee, Ind. Present, $2.52 per net ton. Proposed, $2.39 per net ton. Minimum weight 90 per cent of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply.

THE following are the latest proposed changes in freight rates up to the week beginning January 7, 1924:

Central Freight Association

7702. Sand. Delhi, Ohio, to Springfield, Ohio. Present, $1.40 per net ton; proposed, $1 per net ton.

7712. Crushed stone. Spencer, Ind., to Nisbet, Ind. Present, $1.26 per net ton; proposed, $1.10 per net ton.

7738. Sand and gravel. Wolcottville, Ind., to Auburn, Ind. Present, 76 cents per net ton; proposed, 63 cents per net ton.

7740. Lime. Kenova, W. Va. to stations on the C. & O. railway (present and proposed rates in cents per 2000 lb., except as shown).

To	C. & O. Ry. Stations	Present	Proposed
463	Hinton, W. Va.	315	302
464	Barksdale, W. Va.	315	302
465	Brooks, W. Va.	315	302
466	Long Bottom, W. Va.	315	302
467	Sandstone, W. Va.	315	302
1365	Limeville, Ky. to		
1394	So. Portsmouth, Ky.	189	9*
1425	Buena Vista, Ky. to		
1427	Dravo, Ky.	227	11*
1428	Rome, Ky. to	11c per	No
1500	Cincinnati, Ohio	100 lb.	change
1782	Shay, Ky. to	227	
1842	Belmu, Ky.	265	11*
1843	Winchester, Ky.	265	11*
1844	Quisenberry, Ky. to	265	
1853	Netherland, Ky.	290	11*
1860	Lexington, Ky.	290	11*
1870	Louisville, Ky.	353	13½*

*Per 100 lb.

7741. Stone, rip rap and rubble. Bloomville, Ohio, to Toledo, Ohio. Present, 88 cents per net ton; proposed, 76 cents per net ton. Minimum weight marked capacity of car.

7742. Crushed stone and screenings. Bloomville, Ohio, to Brink Haven, Millersburg and Apple Creek, Ohio. Present, 90 cents to Brink Haven and $1.10 per net ton to Millersburg and Apple Creek; proposed, 80 cents and 90 cents per net ton.

Illinois Freight Association

2195A. Sand and gravel. C. L., minimum weight capacity of car, $1.26 per net ton from Cairo, Metropolis, Palestine and Lincoln, Ill., and $1.39 from Pekin and Peoria, Ill., to Shattuc and Breckemeyer, Ill. (M. R. P. 274).

2266. Crushed stone. C. L., minimum weight capacity of car, $1.13 per net ton from Rockford, Ill., to Lostant, Wenona, Rutland, Mionk, El Paso, Normal and Bloomington, Ill.

2273. Sand and gravel. C. L., minimum weight 90 per cent of marked capacity of car, $1 per net ton from Muscatine, Iowa, to Matherville, Gilchrist and Aledo, Ill.

2275. Sand and gravel. C. L., minimum weight capacity of car, $1.44 per net ton from Cairo, Ill., to C. B. & Q. stations, Ayers and Smithboro, Ill., $1.34 to Hookdale, Boulder and Shattuc, and $1.30 to Cravat, Woodlawn, Waltonville, Valier and Carbon, Ill.

2280. Crushed stone and granite. C. L., minimum weight 90 per cent of marked capacity of car, $1.01 per net ton from Chicago, Ill., to Paris, Ill., rate to be net, any switching charges of connecting lines to be in addition.

2286. Lime, straight C. L., minimum weight 30,000 lb., 14½ cents per 100 lb., from Marblehead, Quincy, Ill., Hannibal, Mo., White Bear and White Rock, Mo., to Kentland, Lisbon Center, Central, Saratoga, Church and Morris, Ill., on the Fox and Illinois Union Ry., via Yorkville, Ill.

New England Freight Association

5735. Lime. West Rutland, Vt. (C. & P. R. R.) to Shelburne Falls, Athol, Boston, West Groton and Turners Falls, Mass., 16 cents; to Gardner, Springfield, Northampton, Greenfield, Worcester, Mass., and Keene, N. H., 15½ cents; to Winchester, Peabody, Woburn, Lynn and Salem, Mass., 17 cents., and to Manchester, N. H. 19½ cents. Reason: To establish rates via Rutland R. R. comparable with rates via D. & H. Co.

Southern Freight Association

12187. Crushed stone. C. L., from Oakley and Ashby, Ala., to Spocari, Ala. Present rate, $16 per car of 30,000 lb., equivalent to 106.7 cents per net ton. Proposed rate, 80 cents per net ton, made in line with rates applying between other Southeastern points.

12208. Lime. C. L., minimum weight 30,000 lb., from Sherwood, Tenn., to Copperhill and Lawrenceburg, Tenn. Class or combination rates now apply. Proposed rates: To Copperhill, $2.91 per net ton, same as now applicable to Chattsworth, Ga.; to Lawrenceburg, Tenn., $2.70 per net ton, same as now applicable to Iron City, Tenn.

12214. Sand and gravel. C. L., from Hobbs Island, Ala., to Huntsville, Ala. Present, 59 cents; proposed, 50 cents per net ton (applicable only on Alabama intrastate traffic). Proposed rate is as published by Southern Ry. from Ryland, Ala.

12273. Bituminous rock, crushed or ground. C. L., from Florence, Ala., to Nashville, Tenn. Present rate 34½ cents per 100 lb. (6th class); proposed, $1.69 per net ton, made in line with rates from and to other points in the same general territory.

Southern Ports Foreign Freight Committee

415. Lime. C. L., from Springfield, Mo., to Gulf ports for export to all countries indicated in Trf. 1061B. Rates: Present, 48 cents per 100 lb.; proposed, 20½ cents per 100 lb.

Southwestern Freight Bureau

10394. Cement. To establish rate of 30½ cents per 100 lb. on cement, carloads, from Ada, Okla., to Port Arthur, Texas. Remarks: Shippers request establishment of same rate to Port Arthur, Texas, as now applies to Beaumont, Texas.

10405. Cement. To establish rates on cement, as shown in W. T. L. Trfs. 132 and 133 series, carloads, minimum weight 38,000 lb., from Oklahoma points to points in Western Trunk Line territory, on basis of 113 per cent of the rates now published carrying a minimum of 50,000 lb. Remarks: It is desired that the Oklahoma Gas Belt mills be given a minimum of 38,000 lb., with rates 13 per cent higher than the rates on minimum weight of 50,000 lb.

10419. Lime. To establish rate of 23½ cents per 100 lb. on lime, carload, minimum weight, 30,000 lb., from Cumberland, Ala., to Bastrop and Monroe, La. Remarks: Shippers contend that same rate should be established to Cumberland as in effect to Chattanooga, Tenn., account distance being approximately the same.

10432. Gravel. Established rate of 5½ cents per 100 lb. on gravel, carloads, from St. Joe, Texas, to Granfield, Okla. Remarks: The proposed change contemplates establishing same rate from St. Joe to Granfield as now applies in the opposite direction.

Western Trunk Line

2689A. Lime. C. L., from Menominee, Mich., to Munising and Newberry, Mich. Present, to Munising, 21 cents, Class C, Newberry, 26 cents; proposed, 12 cents. Minimum 40,000 lb.

3593. Lime, Straight C. L., from White Bear, Mo., to Kentland, Lisbon Center, Central, Saratoga, Church and Morris, Ill., on the Fox and Illinois Union Ry. Co., via Yorkville, Ill. Present, Class C rates; proposed, 14½ cents per 100 lb. Minimum weight 30,000 lb., same as in Consolidated Classification No. 3.

1811B. Sand. C. L., from Clayton, Iowa, to Chicago and Waukegan, Ill. Present, $1.80 per net ton to Chicago, $2 per net ton to Waukegan; proposed, $1.60 per net ton. Minimum weight 90 per cent of marked capacity of car, except when weight of shipment loaded to full visible capacity of the car is less than 90 per cent of the marked capacity, the actual weight will apply, but in no case shall the minimum weight be less than 40,000 lb.

1811 C. Sand. C. L., from Clayton, Iowa, to St. Paul and Minneapolis, Minn. Present, $2.40 per net ton; proposed, $1.80 per net ton. Minimum weight 90 per cent of marked capacity of car, except when weight of shipment loaded to full visible capacity of the car is less than 90 per cent of the marked capacity, the actual weight will apply, but in no case shall the minimum weight be less than 40,000 lb.

3600. Sand (torpedo or building). From Menominee, Mich., to Cairo, Ill. Present, $3.37 per net ton; proposed, to cancel through rates. Minimum weight 90 per cent of marked capacity of car, but not less than 40,000 lb.

Pennsylvania Producers Continue Fight for Lower Rates

THE hearing which was set before Examiner Witters at Pittsburgh, Penn., for January 9, 1924, has been postponed at the request of the railroads, who advanced the arguments that they were busily engaged in other hearings at this time and that they wish additional time in which to prepare an exhaustive defense of their present interstate rates on sand and gravel.

The fight which Pennsylvania producers of sand and gravel are waging has been a long drawn out fight, continuing over a period of several years.

The fight centers chiefly around the fact that the rates on sand and gravel from western Pennsylvania plants are exceedingly high and are considerably greater than the railroads charge on slag and crushed stone in this territory.

The railroads, while admitting that the rates should be the same, and that the slag rates should be increased to the level of those published on sand and gravel, have indicated that they will not take voluntary action toward equalizing these rates.

The complaint now before the Interstate Commerce Commission is expected to bring the matter to a head and will probably force an equalization of the rates on sand and gravel with crushed stone and slag.

There does not seem to be a reason from a transportation standpoint, or from a commercial standpoint, for different rates on these commodities, and if a different basis is recognized by the commission, it will be the first time that such a principle has been recognized by the Interstate Commerce Commission.

Producers therefore in western Pennsylvania are very hopeful of securing an adjustment of this long drawn out controversy with the railroads in this proceeding.

First Aid in Wisconsin Quarries

OWING to the keen interest taken by employers and employes during the past two winters, it has been decided to again hold first-aid meetings in the Wisconsin quarries, according to the following schedule:

Ablemans, February 6, 7, and 8; Milwaukee, February 12, 13, and 14, City Hall; Lannon, February 19, 20, and 21; Mayville, February 26, 27, and 28; Red Granite, March 4, 5, and 6; Fond du Lac, March 11, 12, and 13, Community building; Green Bay, March 18, 19, and 20, American Legion Hall; Wausau, March 25, 26, and 27, City Hall.

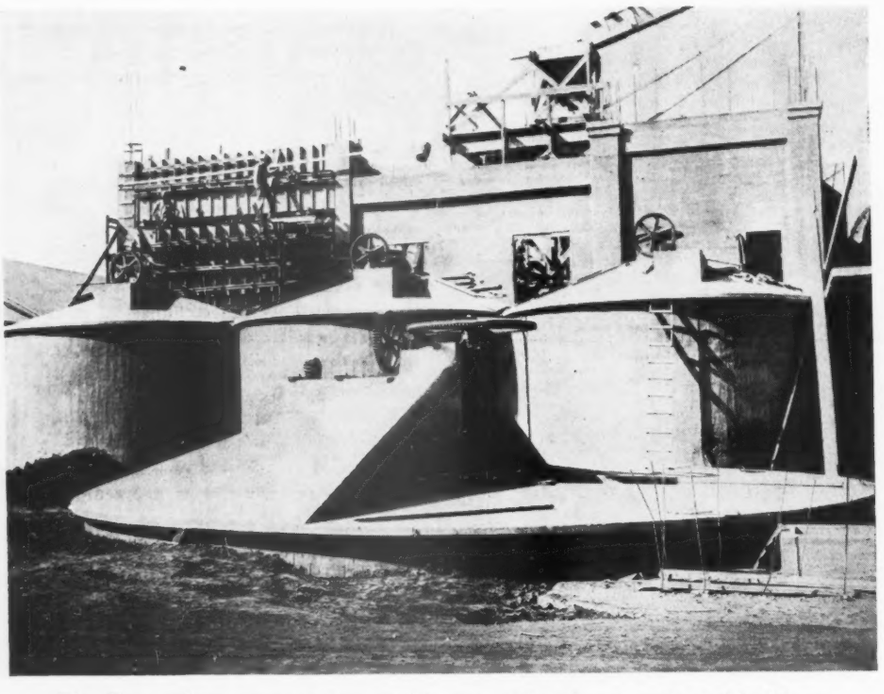
These cities have been selected as the most convenient to the principal groups of quarries. The course of training requires 15 hr. and is of a practical nature. It costs nothing and yet is worth much to the employer and employe in the saving of life and the relieving of much unnecessary suffering. Events that illustrate the value of first-aid training have been of frequent occurrence. Lives have been saved by first-aid men and daily valuable aid is rendered to the injured.

Quarry operators have been invited to send their men to these meetings. Men with previous training are being urged to attend and review their training.

Alabama Commission Reduces Gravel Rates

THE Alabama Public Service Commission has ordered a reduction in rates on gravel from Myrtlewood, Hazel, Orrville and Martin on the Myrtlewood branch of the L. & N. to Linden. The reduction ranged from 7 to 13 cents per ton. The case which resulted in the lowering of the rates was a complaint from Saulsbury & Co., who have a contract for building a road near Linden.

New Machinery and Equipment



The Dorr mixer covered for outside use. The slurry tanks behind have the same mixing mechanism

The Dorr Method of Mixing Cement Slurry

By Clifford H. Tyler, The Dorr Co., New York

THE statement seems well grounded that the attention paid by cement-mill operators to methods of mixing cement slurry is very small in comparison with other steps in the manufacturing process; and too slight in proportion to the possibilities of improvement.

Experience has proved that for the best finished product it is very necessary that the slurry, as fed to the kiln, be uniform in composition; that is, that the various constituents be thoroughly and evenly distributed throughout the mixture. If variation in analysis at this point shows greater than 1 to 2 per cent, the sintered clinker will be inferior and final grinding will not produce a high grade cement.

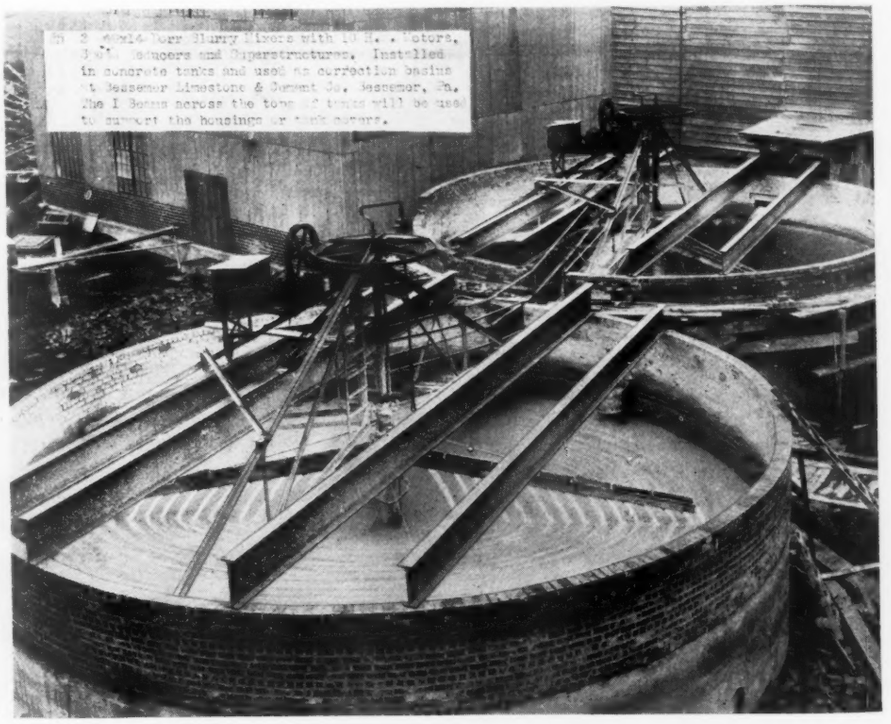
This is generally recognized and variation is kept within the allowable limits, but little effort is made to force the factor as near as zero as possible. The present article will try to describe how a device adapted from the field of metallurgy is used in several progressive plants to keep this change in composition constantly as low as 0.2 per cent and incidentally, paradoxically it would seem, has cut a large percentage of the usual expenditure for construction and power.

There are usually three slurry basins in the flow sheet. In the correction basin any material is added that has been found necessary in the laboratory, the whole is mixed in the mixing basin and kept in the storage basin until fed to the kiln. One or two of these basins may be left out and one made to serve the purpose, but the former method seems the better.

Mixing devices are installed usually in all three tanks. Some operators claim that mixing in the storage tank is unnecessary if proper distribution has been accomplished beforehand, but here again the safer practice would seem desirable. Agitating mechanisms are also used in tanks where clay slurry is stored after coming from the wash mills.

Theory of Mixing

A little thought will show the illogical theory of many methods of slurry mixing. Despite its homogeneous appearance, slurry is a mixture of finely divided solids suspended in water. Obviously, the object in mixing is to distribute the particles of each constituent uniformly throughout the liquid. If the slurry is not sufficiently mixed, motion of the entire mass in the swirl usually produced in paddle agitators is useless and only the forces which change the relative positions of the particles, one with the other, are effective. The power required to start and maintain this useless swirl constitutes a large portion of the total



The Dorr mixer showing agitating gear and the discharge from the central air lift falling back into the mixer

POWER AND AIR MEASUREMENTS

The following table gives power and air measurements taken from actual operation of a few Dorr Mixers of different sizes.

SIZE OF BASIN Diam., Ft.	Depth, Ft.	Capacity Cu. Ft.	Sp. Gr. Slurry	Air Pressure Lbs. per Sq. In.	Free Air, Per Min., Cu. Ft.	Speed of Arms, R.P.M.	Mech. H. P. Motor Input
18	13	3300	1.6	12.5	13.0*	.....	.....
18	13	3300	1.6	10	22.1†	.....	.....
18	13	3300	1.6	15	38.2‡	.....	.....
20	12	3770	1.6	17.5	17.3	2	3.1
34	12	10880	1.6	17.5	58.0	1.5	3.6
34	21	19050	1.6	15	20.5	1.5	5.6

* Minimum Agitation. † Average Agitation. ‡ Strong Agitation.

power taken by this type of mixer. Evidently a method that will cause the particles to be distributed without the necessity of overcoming this huge mass resistance, will accomplish the desired object with the least expenditure of both power and time.

The efficiency of paddle, turbine, propeller, or other types of agitators which depend on a vigorous disturbance to accomplish mixing is not questioned when the materials to be mixed are mobile liquids of similar specific gravity. It will be readily seen, however, that the problem when a mixture of solids and liquids is concerned, is not so simple.

The Dorr Slurry Mixer

The Dorr agitator was developed in metallurgy for use in the cyanide process, wherein the gold and silver is dissolved from the finely ground ore by cyanide solution. The object and problem in this industry are similar to those of cement mixing, inasmuch as a complete and inexpensive mixing of the fine solids and liquid is required. The success of the Dorr method is complete and today is widely used in this and similar metallurgical and chemical processes.

The mixer consists of a circular flat-bottom basin containing a central vertical shaft, which is an air-lift column, revolving in bearings supported above the tank and driven by bevel gears. At the lower end of this air-lift column are two radial arms with plow-blades. Auxiliary air jets on these revolving arms provide vertical miving throughout the basin. At the top of the air lift shaft are two radial distributing troughs, or launders.

The plow-blades on the radial arms sweep the bottom and move the slurry to the center of the tank, whence it is raised by the air lift to the head casting. It then flows through the revolving launders and is distributed uniformly over the surface and the solids pass down by gravity, slowly and evenly throughout the mix.

This distribution of the slurry through the launders combined with the effects of the air jets in the radial arms at the bottom, insures thorough and rapid mixing and entirely avoids the formation of horizontal layers of different chemical composition. The mechanism revolves from one to three revolutions per minute according to the size of the basin. This slow speed indicates that the mixer does not depend on mechanical or swirling agitation for its results. The radial arms produce no rotary motion of the slurry and have no paddle resistance to overcome. The ratio of the power required by the ordinary mechanical mixer to that of the Dorr is usually about 5 to 1, while the ratio of the time required to accomplish maximum distribution is about 2 to 1.

Since in some basins the surface of the slurry is not always at the same level, provision is made for the functioning of the air lift at any level by auxiliary openings in the central air lift. Thus, when the surface drops below one of these openings, the air lift delivers the slurry through this rather than to the distributing launders and the mixing action goes on as usual.

A distinct point of economy in favor of this type of mixer is the fact that units may be as large as 40 ft. or more in diameter. Mixing mechanically with a single mechanism is not practical in tanks larger than 20 to 25 ft. in diameter and for this reason several small slurry tanks are usually found in cement plants where one or two larger units would suffice. Obviously, the first cost of one large unit is much lower than several smaller units of the same capacity. The fact that all parts which move one upon the other are above the level of the slurry. Four mixers operating for a year at one plant averaged for upkeep less than ¼c per ton of material handled.

Cottrell Vibrating Screens

THE makers of the Cottrell screen make the bold assertion that "it will screen practically any material economically and satisfactorily — from boulders to 100-mesh material." This strong claim is to some extent backed up by the experience the makers have had on various kinds and sizes of materials.

Two types of this screen are made. Type A is suitable for coarse and fine screening and Type B is especially for coarse screening and can be used to replace grizzlies and other coarse screens. Both types are built with one, two or three screen decks as required.

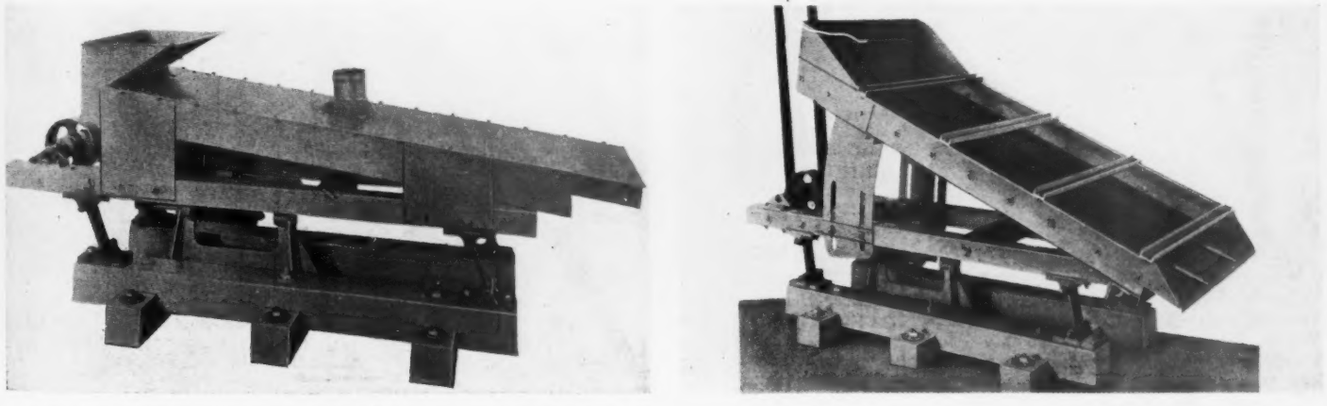
The principle by which the screen operates is very simple. The screen frame or combination of frames is rapidly vibrated by means of an unbalanced pulley, and the speed may be anything from 400 to 1000 r.p.m. There are no lubricating problems and the repair cost is said to be very low.

For fine dry material, the screen is enclosed to prevent dusting. Air suction may be applied if desired to draw away the dust through an upper screen. This makes the machine into an air separator for the removal of minus 200 material, and air flotation is the most economical method of removing such very fine, dry material.

The distance through which the screen vibrates is regulated by the spring tension and the speed of the pulley, and it may be made anything from 1/100 in. to 1½ in.

The Type B screen has a motion at right angles to the screen surface, which makes it very active. The materials are kept in violent agitation with the result that the screening is almost perfect and a high capacity is attained. This makes it especially adapted to screening sand and gravel and crushed stone.

The machine may be used for either wet or dry screening as desired. It is made by the Southwestern Engineering Co. of Los Angeles, Calif.



Left: Cottrell screen, enclosed, which may be used as an air separator. Right: Type B screen used for coarse screening

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Blakeslee, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Buffalo, N. Y.			1.50 per net ton all sizes			
Chaumont, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Cobleskill, N. Y.	1.25	1.25	1.25	1.25	1.25	.....
Coldwater, N. Y.			1.50 per net ton all sizes			
Eastern Pennsylvania	1.35	1.35	1.45	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Prospect, N. Y.	.80	1.40	1.40	1.30	1.30	.....
Walford, Pa.	1.55	1.55	1.55	1.55	1.55	1.55
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL:						
Alton, Ill.	1.75	.....	1.75	1.50	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Ohio	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo, Iowa	1.00	.....	1.45	1.25	1.30	1.30
Chicago, Ill.	.80	1.40	1.10	1.10	1.10	1.10
Dundas, Ont.	.90	1.35	1.35	1.25	1.10	1.10
Greencastle, Ind.	1.25	1.10@1.20	1.05	1.05	.95@1.05	.95@1.05
Krause, Columbia and Valmeyer, Ill.	1.20	1.20	1.35	1.35	1.20	1.20
Lannon, Wis.	.70	1.00	1.00	1.00	.90	.90
St. Vincent de Paul, P. Q.	.85	1.20@1.45	1.15	1.05	.95	.95
Sheboygan, Wis.	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10
Stolle, Ill. (I. C. R. R.)	1.30	.....	1.35	1.35	1.35	1.35
Toronto, Canada	1.90	2.25‡	2.25‡	2.25‡	2.00	2.00
Waukesha, Wis.	1.15	1.15	1.15	1.15	1.15	1.15
SOUTHERN:						
Alderson, W. Va.	.75	1.25	1.40	1.25	1.15	.....
Bridgeport, Texas	1.10	1.40	1.35	1.35	1.25	1.25
Cartersville, Ga.	.....	1.75	1.50	1.00	1.00	.....
Chickamauga, Tenn.	.80@1.00	1.00@1.25	.....	.85@1.00	.85@1.00	.....
Dallas, Texas	1.00	1.35	1.35	1.25	1.25	1.25
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.60	1.70	1.70	1.60	1.50	.....
Garnet and Tulsa, Okla.	.50	1.60	1.60	1.45	1.45	.....
Graysville, Ga.	.75@1.00	.90@1.25	.....	.75@1.00	.75@1.00	.....
Ladds, Ga.	.....	.....	1.40	1.40	1.40	.....
Morris Spur (near Ft. Worth), Tex.	1.10	1.35	1.30	1.25	1.25	1.20
WESTERN:						
Blue Spr'gs and Wymore, Neb.	.20	1.45	1.45	1.35@1.40	1.25@1.30	1.20
Cape Girardeau, Mo.	1.35*	1.35*	1.35*	1.35*	1.10*	.....
Kansas City, Mo.	1.00	1.65	1.65	1.65	1.65	1.65

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.50	1.35	1.15	1.00	.....
Dresser Jct., Wis.	1.00	2.25	.....	1.75	2.00	.....
Duluth, Minn.	1.00	2.25	2.00	1.50	1.40	.....
E. Summit, N. J.	2.00	2.50	.....	1.80	.....	.....
Eastern Massachusetts	.85	1.75	1.75	1.40	1.40	1.40
Eastern New York	.75	1.50	1.50	1.30	1.40	1.30
Eastern Pennsylvania	1.25	1.55	1.50	1.40	1.40	1.40
New Britain, Middlefield, Rocky Hill, Meriden, Conn.	.60	1.50@2.00	1.35@1.50	1.15@1.25	1.00@1.10	.....
Oakland, Calif.	1.00	1.00	1.00	.90	.90	.....
Richmond, Calif.	.50*	.....	1.65*	1.50*	1.50*	.....
San Diego, Calif.	.50@.75	1.80@1.90	1.60@1.80	1.35@1.55	1.35@1.55	1.25@1.45
Spring Valley, Calif.	.70	1.55	1.50	1.40	1.35	1.35
Springfield, N. J.	2.00	2.00	2.20	1.90	1.90	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Atlanta, Ga.—Granite	1.47	2.07	2.07	1.97	1.97	.....
Buffalo, N. Y.—Granite	.90	.....	1.20	1.00	1.05	1.10
Berlin, Utley and Red Granite, Wis.	1.60	1.70	1.60	1.50	1.40	.....
Columbia, S. C.	.....	.....	2.00	1.75	1.75	.....
Eastern Penna.—Sandstone	.85	1.60	1.55	1.35	1.35	1.30
Eastern Penna.—Quartzite	1.20	1.35	1.20	1.20	1.20	1.20
Lithonia, Ga.—Granite	.75	1.75	1.60	1.25	1.25	1.00
Los Angeles, Calif.	2.00	2.00	1.85	1.75	1.65	.....
Middlebrook, Mo.—Granite	3.75@4.00	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Sioux Falls, S. D.—Granite	1.00	1.60	1.55	.....	1.50	.....

*Cubic yd. ‡Prices include 90c freight.

Agricultural Limestone

(Pulverized)

Cassadaga, N. Y.—Marl, 50 lb. hemp bags	7.00@ 9.00
Chaumont, N. Y.—Analysis, 95% $CaCO_3$, 1.14% $MgCO_3$—Thru 100 mesh; sacks, 4.50; bulk	3.00
Branchton, Pa.—Analysis, 94.89% $CaCO_3$, 1.50% $MgCO_3$; 60% thru 100 mesh; 45% thru 200 mesh; 100% thru 20 mesh; sacks, 5.00	3.50
Hillsville, Pa.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; 94% thru 50 mesh; sacks, 5.00; bulk	4.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.15; bulk	2.65
New Castle, Pa.—94% $CaCO_3$, 1.40% $MgCO_3$—75% thru 100 mesh, 94% thru 50 mesh; sacks, 5.00; bulk	3.50
West Stockbridge, Rockdale, Mass., North Pownal, Vt.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25
Alton, Ill.—Analysis, 98% $CaCO_3$; 0.5% $MgCO_3$; 90% thru 100 mesh	4.00
Belleville, Ont.—Analysis, 90.9% $CaCO_3$, 1.15% $MgCO_3$—45% to 50% thru 100 mesh, 61% to 70% thru 50 mesh; bulk	2.50
Cypress, Ill.—Analysis, 96.12% $CaCO_3$, 2.5% $MgCO_3$; 50% thru 100 mesh, 90% thru 50 mesh, 50% thru 50 mesh, 90% thru 4 mesh	1.50
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 80-lb p. sacks 5.00; bulk	3.50
Piqua, Ohio—Total neutralizing power 95.3%; 100% thru 10, 60% thru 50; 50% thru 100	2.10@ 2.25
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.00; bulk	3.50
100% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Waukesha, Wis.—Analysis, neutralizing equivalent 107.38% $CaCO_3$; 99% thru 10 mesh, 55% thru 60 mesh; bulk	2.35
200-mesh bags ex., returnable	4.50
Hot Springs, N. C.—50% thru 100 mesh; sacks, 4.25; bulk	2.70
Knoxville, Tenn.—75% thru 100 mesh, bags, 3.95; bulk	2.70
Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200 lb. burlap bag, 4.00; bulk	2.75
Mountville, Va.—Analysis, 76.60% $CaCO_3$, 22.83% $MgCO_3$—50% thru 100 mesh; 100% thru 20 mesh; sacks	5.00
Colton Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk	4.00
Lemon Cove, Calif.—Analysis, 94.8% $CaCO_3$, 0.42% $MgCO_3$; 60% thru 200 mesh; sacks, 5.25; bulk	4.50
Dundas, Ont.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$—35% thru 100 mesh; 50% thru 50 mesh; 100% thru 10 mesh; bagged, 4.75; bulk	3.00

Agricultural Limestone

(Crushed)

Bellevue, Ohio—Analysis, 61.56% $CaCO_3$, 36.24% $MgCO_3$; ¼ in. to dust, about 20% thru 100 mesh	1.25
Bettendorf, Iowa, and Moline, Ill.—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Buffalo, Iowa—90% thru 4 mesh	1.00
Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; 90% thru 50 mesh	1.50
Chicago, Ill.—Analysis, 53.63% $CaCO_3$, 37.51% $MgCO_3$; 90% thru 4 mesh	.80
Elmhurst, Ill.—Analysis, 35.73% $CaCO_3$, 20.69% $MgCO_3$; 50% thru 50 mesh	1.25
Huntington and Bluffton, Ind.—Analysis, 61.56% $CaCO_3$, 36.24% $MgCO_3$; about 20% thru 100 mesh	1.25

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Agricultural Limestone

(Continued from preceding page)

Greencastle, Indiana.—Analysis, 98% $CaCO_3$; 50% thru 50 mesh	2.00
Kansas City, Mo.—50% thru 100 mesh	1.25
Krause and Columbia, Ill.—Analysis, 90% $CaCO_3$, 90% thru 4 mesh	1.20
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 100% thru 4 mesh; 83% thru 10 mesh; bulk	1.25
Milltown, Indiana.—Analysis, 94.41% $CaCO_3$, 2.95% $MgCO_3$; 35% thru 50 mesh	1.40@ 1.65
Narlo, Ohio.—Analysis, 56% $CaCO_3$ 43% $MgCO_3$; limestone screenings, 37% thru 100 mesh, 55% thru 50 mesh, 100% thru 4 mesh	1.50@ 2.00
Ohio (different points), 20% thru 100 mesh; bulk	1.25@ 1.50
Piqua, Ohio—100% thru 4 mesh	1.25
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stolle, Ill., near East St. Louis on I. C. R. R.—Thru ¼-in. mesh	1.30
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Waukesha, Wis.—No. 1 kiln dried	2.00
No. 2 Natural	1.75
Alderson, W. Va. — Analysis, 90¼ $CaCO_3$; 90% thru 50 mesh	1.75
Claremont, Va.—Analysis, 92% $CaCO_3$, 2% $MgCO_3$; 90% thru 50 mesh	3.00
50% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh	2.75
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50
Ladds, Ga.—Analysis, 56% $CaCO_3$, 40% $MgCO_3$—all passing 10 mesh	1.50@ 1.75
Garnett, Okla.—Analysis, 80% $CaCO_3$, 3% $MgCO_3$; 100% thru 4 mesh	.50
Kansas City, Mo., Corrigan Siding—50% thru 100 mesh; bulk	1.80
Tulsa, Okla.—90% thru 4 mesh	.50

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

Glass Sand:	
Berkeley Springs, W. Va.	2.25@ 2.50
Cedarville and South Vineland, N. J.—Damp, 1.75; dry	2.25
Cheshire, Mass.—24 mesh, 5.00; 40 mesh, 6.00; 100 mesh	7.00
Columbus, Ohio	1.50@ 1.75
Dunbar, Pa.—Damp	2.50
Falls Creek, Pa.	2.25
Hancock, Md.—Damp, 1.50; dry	2.00
Klondike and Pacific, Mo.	2.00@ 2.50
Mapleton, Pa.	2.25@ 2.50
Mapleton Depot, Pa.	2.00@ 2.50
Massillon, Ohio	3.00
Michigan City, Ind.	.50
Millville, N. J.	2.00
Mineral Ridge, Ohio	2.50
Ottawa, Ill.	1.50
Pittsburgh, Pa.—Dry, 4.00; damp	3.00
Ridgway, Pa.	2.50
Rockwood, Mich.	2.50@ 2.75
Round Top, Md.	2.25
Sands, Pa.	2.50
San Francisco, Calif.	3.00@ 3.50
St. Louis, Mo.	2.50@ 3.00
Thayers, Pa.	2.00@ 2.50
Utica, Ill.	1.25@ 1.50
Zanesville, Ohio	2.00@ 2.50
Foundry Sand:	
Albany, N. Y. — Molding fine, brass molding	3.00
Molding coarse	2.75
Sand blast	4.00
Allentown, Pa.—Core and molding fine	1.75@ 2.00
Arenzville, Ill.—Molding fine	1.50@ 1.75
Brass molding	1.75
Beach City, Ohio.—Core, washed and screened	2.00@ 2.50
Furnace lining	2.50@ 3.00
Molding fine and coarse	2.25@ 2.50
Cheshire, Mass.—Furnace lining, molding fine and coarse	5.00
Sand blast	5.00@ 8.00
Stone sawing	6.00
Cleveland, Ohio.—Molding coarse	1.50@ 2.00
Brass molding	1.50@ 2.00
Molding fine	1.50@ 2.25
Core	1.25@ 1.50

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge and So. Hts., Pa.	1.25	1.25	1.15	.85	.85	.85
Buffalo, N. Y.	1.10	.95	.....	.....	.85	.....
Erie, Pa.	.....	1.00	.....	1.25	.....	1.75
Farmingdale, N. J.	.68	.68	.95	1.30	1.30	.....
Pittsburgh, Pa.	1.25	1.25	.90	.85	.85	.85
Portland, Me.	.....	.50	1.75	.....	1.35	1.25
Washington, D. C.—Rewashed, river	.75	.75	1.60	1.40	1.20	1.20
CENTRAL:						
Columbus, Ohio	.75	.75@1.15	.75@1.15	.75	.75@1.15	.75
Covington, Ind.	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.50	1.25	1.60	1.60	1.60
			Unwashed ballast, .50 ton			
Attica, Ind.	.75	.75	.75	.75	.75	.75
Eau Claire, Wis.	.40@ .50	.40@ .50	.85@1.25	.....	.....	.85
Elkhart Lake, Wis.	.60	.60	.70	.70	.70	.70
Grand Rapids, Mich.	.....	.50	.....	.80	.....	.70
Hamilton, Ohio	.....	1.00	.....	.....	1.00	.....
Hersey, Mich.	.50	.50	.....	.75	.....	.70
Indianapolis, Ind.	.60	.60	.....	1.50	.75@1.00	.75@1.00
Janesville, Wis.	.....	.65@ .75	.....	.....	.65@ .75	.....
Mason City, Iowa	.65	.65	1.75	1.70	1.65	1.65
Mankato, Minn.	.50†	.40	.....	.....	1.35	.....
Milwaukee, Wis.	1.11	1.11	1.36	1.36	1.36	1.36
Moline, Ill.	.60	.60	Concrete gravel, 40% G., 60% S., .90			
Palestine, Ill.	.75	.75	.75	.75	.75	.75
St. Louis, Mo., f.o.b. cars	1.20	1.45	1.65§	1.45	.....	1.45‖
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.75	1.00	1.00	.90	.90
Waukesha, Wis.	.50	.50	.80	.80	.80	.80
Winona, Minn.	.40	.40	1.75	1.50	1.40	1.40
			(.05 ton discount 10 days)			
SOUTHERN:						
Brookhaven, Miss.; Roseland, La.	.75	.50	.....	.....	1.25	.....
Charleston, W. Va.	all sand 1.40 f.o.b. cars		all gravel 1.50 f.o.b. cars			
Ft. Worth, Texas	2.25	2.25	2.25	2.25	2.25	2.25
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Lake Weir, Fla.	.....	.50	.....	.....	.....	.....
New Martinsville, W. Va.	1.00	1.00	.....	.....	1.20	.80
WESTERN:						
Kansas City, Mo.			Kaw river sand .75 per ton f.o.b. plants			
Los Angeles, Calif.	.....	.85@1.15	1.00@1.25	1.00@1.25	1.00@1.25	.....
Pueblo, Colo.	1.10*	.90*	.....	.....	1.50*	.....
San Diego, Calif.	.50@.65	.80@.90	1.40@1.50	1.20@1.30	1.00@1.10	1.00@1.10
Seattle, Wash. (bunkers)	1.25*	1.25*	1.50*	1.25*	1.25*	1.25*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Boonville, N. Y.	.60@ .80	.....	.55@ .75	.....	.....	1.00
Brookhaven, Miss., Rosel'd, La.	.75	.50	.....	.....	1.25	.....
Dudley, Ky.‡	1.00	1.00	.....	.95	.....	.....
Elkhart Lake, Wis.	.60	.50	.....	.....	.....	.....
Fishers, N. Y.	.60	.....	.60	.....	.....	.50
Gainesville, Texas	.....	.95	.....	.....	.....	.55
Grand Rapids, Mich.	.....	.....	.....	.....	.....	.60
Hamilton, Ohio	.....	.....	.....	.....	.70	.....
Hersey, Mich.	.....	.....	.....	.50	.....	.....
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas	.....	1.40	.....	.....	.....	.55
Mankato, Minn.			Pit run gravel, .50			
Moline, Ill.	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
St. Louis, Mo.	.....	.....	.....	.....	.....	1.55
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.			Gravel, .60 a ton			
York, Pa.	.....	.95@1.20	(crushed rock)			
Zanesville, Ohio	.....	.60	.60	.....	.....	.....

*Cubic yd.; † pit run; §⅝ inch and less; ‖2½ inches and less; ‡crushed rock.

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in. and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y.	2.35	1.25	1.25	1.25	1.25	1.25	1.25
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, O.	2.05	1.45	1.80	1.45	1.45	1.45	1.45
Jackson, O.		1.35		1.35	1.35	1.35	1.35
Youngstown, Dover, Hubbard, Leetonia, Struthers, O.	2.00	1.25	1.35	1.25	1.25	1.25	1.25
SOUTHERN:							
Alabama City, Ala.	2.05	.80	1.25	1.15	1.10	.95	.85
Ashland, Ky.		1.55		1.55	1.55	1.55	1.55
Ensley, Ala.	2.05	.80	1.25	1.15	1.10	.95	.85
Longdale, Goshen, Glen Wilton, Roanoke, Low Moor, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Adams, Mass.			7.00				2.90	
Bellefonte, Pa.		10.50*	10.50*	10.50*	9.00		8.50	1.80
Buffalo, N. Y.		11.00		12.00			10.00	
Berkeley, R. I.			12.00					2.30
Lime Ridge, Pa.							5.00a	
West Stockbridge, Mass.								2.25
Williamsport, Pa.			10.00				6.00	
York, Pa. (dealers' prices)		10.50	10.50	11.50			8.50	1.65b
CENTRAL:								
Cold Springs, Ohio	12.50	11.00	10.00		9.00	11.00‖	10.00	
Delaware, Ohio	12.50	10.00	9.00	11.00			9.00	1.60
Gibsonburg, Ohio	12.50	11.00	10.00		9.00	11.00	10.00	
Huntington, Ind.	12.50	11.00	10.00				10.00	1.60c
Luckey, Ohio	12.50‡	11.00	9.00‡				10.00	1.60
Marblehead, Ohio		11.00	10.00				10.00	1.60d
Marion, Ohio		11.00	10.00				10.00	1.80†
Sheboygan, Wis.							10.00	
Tiffin, Ohio					9.00			
White Rock, Ohio	12.50				9.00	11.00		
Woodville, O. (dlrs.' price)	12.50‡	11.00‡	10.00‡		9.00	10.50	10.00	1.60
SOUTHERN:								
Erin, Tenn.							7.50	1.35
El Paso, Texas							10.00	1.50
Karo, Va.							7.00	1.50
Knoxville, Tenn.	12.50	11.00	11.00	11.00	8.50		8.50	1.50
Ocala and Zuber, Fla.	13.00		10.00		11.00		10.00	1.70
Sherwood, Tenn.	12.50	11.00	11.00	11.00			8.50	1.50
Staunton, Va.					4.50		8.50	1.35
WESTERN:								
Colton, Calif.			15.00				19.70	
Kirtland, N. M.							12.50	15.00
San Francisco, Calif.	22.00	22.00	15.00	22.00				2.50
Tehachapi, Calif.							13.00	2.10e

*Paper sacks; †180-lb. net, non-returnable metal barrel; ‡50-lb. paper bags, terms 30 days net, 25c per ton or 5c per bbl. discount for cash in 10 days from date of invoice; ‖ 80-lb. paper bags; (a) F. O. B. kilns; (b) 200 lbs. net; 2.65, 300 lbs. net; (c) wooden bbls.; (d) wooden, 1.60, steel, 180; e, wooden bbls., steel bbls., 2.20.

Miscellaneous Sands

(Continued from preceding page)

Columbus, Ohio—Core	.50@ 2.00
Furnace lining	2.00@ 2.50
Molding fine and coarse	1.50@ 2.50
Sand blast	3.50@ 5.50
Stone sawing	1.50@ 1.75
Traction	.50@ 1.50
Brass molding	2.00@ 3.00
Delaware, N. J.—Molding fine	2.00
Molding coarse	1.90
Brass molding	2.15
Dunbar, Pa.—Traction	2.50
Dundee, Ohio.—Glass, core, sand blast traction	**2.50**
Molding fine, brass molding (plus 75c for winter loading)	**2.00**
Molding coarse (plus 75c for winter loading)	**1.75**
Eau Claire, Wis.—Sand blast	3.25@ 3.75
Falls Creek, Pa.—Molding, fine and coarse	**1.75**
Sand blast	**2.00**
Traction	**1.75**
Franklin, Pa.—Core	**2.00**
Furnace lining	**2.50**
Molding coarse	2.00
Brass molding	2.75
Joliet, Ill.—No. 2 molding sand and loam for luting purposes; milled	**.80**
Bank run	**.65**
Kansas City, Mo.—Missouri river core	.80
Kasota, Minn.—Molding fine	1.60@ 1.85
Molding coarse, stone sawing	1.45@ 1.75
Klondike, Pacific, Gray Summit, Mo.—Molding fine and coarse, stone sawing, roofing sand	2.00
Mapleton Depot, Pa.—Molding fine	2.00@ 2.50
Traction	2.00@ 2.25
Massillon, Ohio—Molding fine, coarse, furnace lining and core	3.00
Traction	2.75
Michigan City, Ind.—Core, traction	.50
Millville, N. J. Core	2.00
Mineral Ridge, Ohio—Furnace lining, molding fine and coarse, roofing sand, sand blast, stone sawing (green)	2.00
Traction (green)	1.80
Core (green)	2.25
Montoursville, Pa.—Core	1.25@ 1.50
Brass molding	1.50
Traction	1.25
New Lexington, Ohio—Molding fine	2.75
Molding coarse	2.50
Ottawa, Ill.—Molding, coarse (crude)	1.00@ 1.25
Ottawa, Minn.—Crude silica sand	.75@ 1.00
Ridgway, Pa.—Core	2.00
Furnace lining, molding fine, molding coarse	1.25
Traction	2.25
Rockwood, Mich.—Core	2.00@ 2.50
Roofing	2.75@ 3.00
Sand blast	**3.75**
Round Top, Md.—Roofing sand	2.25
Traction	1.75
Core	1.60

Miscellaneous Sands

(Continued)

San Francisco, Calif. (washed and dried)—Core, molding fine, roofing sand and brass molding	3.00@ 3.50
(Direct from pit)	
Furnace lining, molding coarse, sand blast	3.60
Stone sawing, traction	2.30
St. Louis, Mo.—Red heavy molding	1.50@ 2.25
Red fine	1.50@ 2.00
Molding fine and brass	2.00@ 3.00
Skein core	1.75@ 2.25
White core sand	1.00@ 1.75
Sand blast	2.00@ 4.50
Furnace lining	1.50@ 2.50
Roofing sand	1.00@ 1.50
Stone sawing	1.25@ 2.00
Tamalco, Ill.—Molding coarse	1.40@ 1.60
Thayers, Pa.—Core	2.00
Furnace lining	1.25
Molding fine and coarse	1.50
Utica, Ill.—Core (crude and dry)	.75@ 1.50
Furnace lining, molding fine and coarse (crude and dry), brass molding	.85@ 1.50
Roofing sand, stone sawing	1.25@ 2.50
Sand blast	2.50
Traction	1.25
Warwick, Ohio—Core, green, 2:00; dry	2.50
Molding fine, molding coarse, green, 2.00; dry	2.50
Traction	2.50
Zanesville, Ohio—Molding fine, brass molding	2.00
Molding coarse	1.75

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Asheville, N. C.—Best white and 200-mesh (per ton)	8.00
Yellow (per ton)	9.00
Red (per ton)	13.00
Baltimore, Md.—Crude talc (mine run)	3.00@ 4.00
Ground talc (20-50 mesh), bags	10.00
Cubes	55.00
Blanks (per lb.)	.08
Pencils and steel workers' crayons, per gross	1.25
Chatsworth, Ga.—Crude talc (grindings)	5.00
Ground talc (150-200 mesh), bags	8.00@15.00
Pencils and steel workers' crayons, per gross	1.00@ 2.50
Chester, Vt.—Ground talc (150-200 mesh), bulk	7.00@ 9.00
Including bags	8.00@ 9.00
Emeryville, N. Y.—325 mesh	14.75
Hailesboro, N. Y.—Ground talc (150-250 mesh), bags	18.00
Henry, Va.—Crude talc (lump mine run) per 2000-lb. ton	3.00@ 3.50
Ground (150-200 mesh), bags	8.75@16.00
Keeler, Calif. (200 mesh)	15.00@20.00
(300 mesh)	20.00@30.00
(Bags extra)	
Los Angeles, Calif.—Crude	15.00@22.00
Marshall, N. C.—Crude talc, bags	4.50
Ground (20-60 mesh)	6.50
Ground talc (150-200 mesh); bags	8.00@12.00
Natural Bridge, N. Y.—Ground talc (300-325 mesh) bags	12.00@13.00
Rochester and East Granville, Vt.—Ground talc (20-50 mesh), bulk	8.50@10.00
Ground talc (150-200 mesh), bulk	10.00@22.00
Vermont—Ground talc (20-50 mesh); bags	7.50@10.00
Ground talc (150-200 mesh); bags	8.50@15.00
Waterbury, Vt.—Ground talc (20-50 mesh), bulk	7.50@10.00
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@22.50
(Bags extra)	
Pencils and steel workers' crayons, per gross	1.20@ 2.50

Rock Phosphate

(Raw Rock)

Per 2240-lb. Ton

Centerville, Tenn.—B.P.L. 65%, bags	8.50
Bulk	6.50
Gordonsburg, Tenn.—B.P.L. 68-72%	5.50@ 6.00
Mt. Pleasant, Tenn.—Analysis, 65% B.P.L. (2000 lb.)	6.50
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.	7.00
Paris, Idaho.—2000 lb. mine run, B.P.L. 75%	4.50@ 5.00
Ottawa, Minn.—All crude silica sand	.75@ 1.00

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Clay Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12	$10.20	$10.00	$8.10	$7.80
24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10	12.60	11.00	8.70	8.75
18x10	12.60	11.00	8.70	8.75
18x 9	12.60	11.00	8.70	8.75
16x10	12.60	11.00	8.40	8.75
16x 9	12.60	11.00	8.40	8.75
16x 8	12.60	11.00	8.40	8.75
18x12	12.60	11.00	8.70	8.75
16x12	12.60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x 8	11.10	10.50	8.10	7.80
14x 7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

(Ground Rock)

Wales, Tenn.—B.P.L. 70%	7.75
Per 2000-lb. ton	
Barton, Fla.—Analysis, 50-65% B.P.L.	3.50@ 8.00
Centerville, Tenn.—B.P.L., 65%*	6.50*
Mt. Pleasant, Tenn.—B.P.L. 65%	6.50
Twomey, Tenn.—B.P.L. 65%	6.00@ 6.50

*Less $1.00 per ton dealer commission.

Florida Soft Phosphate

(Raw Land Pebble)

	Per Ton
Florida—F. O. B. mines, gross ton, 68/66% B.P.L.	3.25
70% min. B.P.L.	3.55
72% min. B.P.L.	3.85
Jacksonville (Fla.) District	10.00@12.00

(Ground Land Pebble)

	Per Ton
Jacksonville, Fla., District	14.00
Add 2.50 for sacks.	
Morristown, Fla.—26% phos. acid	16.00
Mt. Pleasant, Tenn.—65% B.P.L.	5.75

Fluorspar

Fluorspar—80% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	22.00
Fluorspar—85% and over calcium fluoride, not over 5% silica; per ton f.o.b. Illinois and Kentucky mines	23.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars		10.50
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries		17.50
Deerfield, Md. — Green; bulk	7.00	7.00
Easton, Pa.—Slate granules		6.50
Granville, N. Y.—Red slate granules		7.50
Harrisonburg, Va.—Blk. marble (crushed, in bags)	14.50	14.50
Ingomar, Ohio (in bags)		6.50@20.00
Mertztown, Pa. (granite) bags, $10.00; bulk		8.00
Milwaukee, Wis. (del.)		13.50
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Middlebrook, Mo.—Red		25.00@30.00
Phillipsburg, N. J.—Evergreen, bulk	8.00@10.00	8.00@10.00
Creme and royal, bulk	15.00@20.00	15.00@20.00
Poultney, Vt.—Slate granules		7.50
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Tuckahoe, N. Y.—(2000 lb.)		6.00@12.00
Whitestone, Ga.—White marble chips, net ton in bulk, f.o.b. cars, granite	4.50@ 6.00	4.50@ 6.00

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Carpenterville, N. J.	19.00	31.50@45.00
Ensley, Ala. ("Slagtex")	16.00	26.00
Eugene, Ore.	25.00	35.00@70.00
Friesland, Wis.	21.00	32.00
Omaha, Neb.	18.00	30.00@40.00
Portland, Ore. (Del'd)	21.00	45.00@55.00
Puyallup, Wash.	20.00	30.00@75.00
St. Paul, Minn.	15.00	30.00@45.00
Wauwatosa, Wis.	15.00@16.00	28.00@75.00
Winnipeg, Can.	18.00	26.00

Sand-Lime Brick

Prices given per 1,000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	15.00@16.00
Dayton, Ohio	13.50
Grand Rapids, Mich.	11.00
Lancaster, N. Y.	14.00
Michigan City, Ind.	11.00
Milwaukee, Wis. (delivered)	14.00
Portage, Wis.	15.00
Saginaw, Mich.	12.00
Syracuse, N. Y. (delivered at job)	20.00
F.o.b. cars	15.00@16.00

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrate per Ton Finishing	Common
Atlanta, Ga.	23.00	14.00
Baltimore, Md.	24.25	17.85
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	20.00
Dallas, Tex.	20.00	———
Denver, Colo.	24.00	———
Detroit, Mich.	20.00	19.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	———	21.00
New York, N. Y.	18.20	13.10
St. Louis, Mo.	24.00	20.00
San Francisco, Calif.	22.00	———
Seattle, Wash. (paper sacks)	24.00	———

Portland Cement

Prices per bbl. and per bag net in carload lots.

	Per Bag	Per Bbl.
Atlanta, Ga.	———	2.60
Boston, Mass.	———	2.53@2.63
Buffalo, N. Y.	———	2.38@2.48
Cedar Rapids, Iowa	.59½	2.38@2.48
Cincinnati, Ohio	.60¾	2.41@2.54
Cleveland, Ohio	.60¾	2.41
Chicago, Ill.	.52½	2.10
Columbus, Ohio	———	2.44
Dallas, Texas	.53¾	2.15
Davenport, Iowa	.57½	2.29
Dayton, Ohio	———	2.38
Denver, Colo.	———	2.84
Detroit, Mich.	.59¼	2.37
Duluth, Minn.	.54¾	2.25
Indianapolis, Ind.	.57¾	2.31
Kansas City, Mo.	.66¾	2.37
Los Angeles, Cal. (less 5c dis.)	.77	3.08
Memphis, Tenn.	———	2.60
Milwaukee, Wis.	.56¼	2.25
Minneapolis, Minn.	.61	2.44
Montreal, Canada (sks. 20c ext.)	———	2.25
New Orleans, La.	———	2.90
New York, N. Y.	———	2.25
Philadelphia, Pa.	———	2.41
Phoenix, Ariz.	———	3.30
Pittsburgh, Pa.	.54¾	2.19
Portland, Ore.	———	3.05
San Francisco, Cal.	———	2.61
St. Louis, Mo.	.55	2.20
St. Paul, Minn.	.61	2.44
Seattle, Wash. (10c bbl. dis.)	———	2.90
Toledo, Ohio	.59½	2.38

NOTE—Add 40c per bbl. for bags.

Mill prices f. o. b. in Carload Lots to Contractors

	Per Bag	Per Bbl.
Buffington, Ind.	.46¼	1.95
Cincinnati, Ohio	———	3.00†
Concrete, Wash.	———	2.60
Dallas, Texas	———	2.15
Dayton, Ohio	———	2.85†
El Paso, Tex.	———	3.20*
Hannibal, Mo.	———	1.95
Hudson, N. Y.	———	2.05
Indianapolis, Ind.	———	2.96†
Leeds, Ala.	———	1.95
Los Angeles, Calif.	———	2.80
Louisville, Ky.	———	2.37
Memphis, Tenn.	———	3.24†
Northampton, Pa.	———	1.95
Phoenix, Ariz.	———	4.30‡
Steelton, Minn.	.50	2.06
Universal, Pa.	.48¾	2.00

*Gross, 10c sacks and 10c per bbl. disc 10 days.
†Including cloth sacks.
‡Gross, 15c sacks and 5c per bbl. disc. 10 days

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco* Calcined Gypsum	Cement‡ and Gauging Plaster	Wood Fiber	White§ Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	——Plaster Board—— ¼x32x36" Weight 1500 lb. Per M Sq. Ft.	——Plaster Board—— ⅜x32x36" Weight 1850 lb. Per M Sq. Ft.	Wallboard. ⅜x32 or 48" Lengths 6'-10', 1850 lb. Per M Sq. Ft.
Douglas, Ariz.	———	6.00	6.00	———	13.00	———	———	———	———	———	———	———	———
Fort Dodge, Iowa	3.00	3.50	6.00	8.00	10.00	10.50	20.00	———	21.30	20.00	20.00	———	30.00
Garbutt, N. Y.	———	———	6.00	8.00	10.00	10.00	———	7.00	———	———	———	20.00	———
Grand Rapids, Mich.	3.00	———	5.00	10.00	10.00	10.00	———	———	31.00	———	19.75	20.00	30.00
Hanover, Mont.	4.50	———	6.00	10.00	———	10.50	———	———	———	———	———	———	———
Mound House, Nev.	———	8.50	6.50	10.50@11.50	———	———	———	———	———	———	———	———	———
Oakfield, N. Y.	3.00	4.00	6.00	8.00	10.00	10.00	20.20	7.00+	30.75	21.00	19.375	20.00	30.00
Rapid City, S. D.	4.00	———	———	10.00	11.00	11.50	———	———	33.75	———	———	———	———
San Francisco, Calif.	———	———	———	16.40	———	———	———	———	———	———	———	———	———
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	———	———	———	———	28.50	———	35.00

NOTE—Returnable Bags, 10c each; Paper Bags, $1.50 per ton extra (not returnable).
*Shipment in bulk 25c per ton less; ‡Bond plaster $1.50 per ton additional; +Sanded Wood Fiber $2.50 per ton additional; §White Moulding 50c per ton

News of All the Industry

Incorporations

Silica Sand Co., Ltd., Toronto, Ont., Canada, has been incorporated.

Dominion Sand and Gravel Ltd., Hamilton, Ont., Canada, has been incorporated with a capital of $50,000 to quarry and deal in stone, gravel and sand. They have a quarry at Westdale and contemplate building a plant at Hamilton.

Huron Sand and Gravel Co., Ltd., Toronto, Ont., Canada, has been incorporated with a capital of $100,000 to dredge, quarry and treat stone, sand, gravel, cement, etc.

Raymond Cement Products Ltd., Montreal, has been incorporated.

Long-Bell Stone Co. Quarry stone, rock, etc. $200,000. M. L. Rogers, L. A. Irwin. W. G. Singer, Wilmington, Del. (Registration Trust Co.)

Bellrose Sand Co., Inc., Central Life building, Ottawa, Ill. Mine and quarry sand, stone, clay, gravel, coal, mineral, etc. Incorporators: Vernon K. Bellrose, R. A. Gren, Thos. H. Bellrose. Correspondent: R. A. Gren, 402 Centarl Life building, Ottawa.

Gifford Sand and Gravel Co., Dallas, Texas; capital stock, $20,000. Incorporators: P. W. Gifford, C. W. Edwards, E. J. Gannon, Jr., all of Dallas.

South Portland Construction Co., Portland, Me., to deal in concrete blocks and tiles, capital stock $100,000. Directors, Joseph Caminiti, Portland, president; Wesley C. Cookson, South Portland, treasurer; and James Corosso, Portland.

Puget Sound Lime and Oil Co. of Seattle, Wash.; capital stock, $400,000. Incorporators, Charles W. Littlefield, Philip T. Molleur and Dan C. Brownell.

Marengo Crushed Stone Co., Marengo, Ind.; capital $50,000; to quarry and manufacture crushed stone; directors, L. O. Walters, J. H. Thornburgh, C. A. Dark, H. G. Roetzel, T. C. Mullins, C. E. Powell.

Muskingum River Gravel Co., Muskingum, Ohio; $20,000 to $60,000.

Sycamore Canyon Gravel Co., Whittier, Calif. Capital stock, $750,000; shares, 7500; subscribed, $25,000.

N. L. P. Builders Artificial Stone Works, Brooklyn, N. Y.; $20,000; A. Van Heest, J. B. Goldsmith. (Attorney, S. Mash, 1770 Broadway.)

Sand and Gravel

San Antonio, Texas, has leased a gravel pit with the privilege of taking as much gravel as the city needs for $50 a month. The lease is to run three years.

Alabama State R. R. Commissioners have been asked to consider sand and gravel rates from Glendon to Mobile. The complaint was made by Mobile county which owns a pit at Mobile.

Colusa Rock and Sand Co., subsidiary of V. R. Dennis and Co. of Portland, Ore., is to operate four miles from Colusa, Calif. Sand and gravel will be taken from the river. A power company is installing transformers for 150-hp. motors. The Southern Pacific Co. will build spur tracks to the place. A rock crusher will be installed.

Los Angeles Rock and Gravel Co. offer to sell to the city 150 acres of land in the Arroyo Seco lying between Avenue 20 and Avenue 60, was rejected by the city council. The company offered to sell the land to the city for $1,000,000, arguing that the city could establish playgrounds and parks and build a scenic highway through the arroyo over the land, as well as digging out rock gravel and sand which the company declared was worth $1,500,000.

"Eight thousand one hundred and forty-seven wagon loads of LaGrange gravel will be used on the four-mile stretch of state highway from Paris north to Salem schoolhouse," relates the Monroe County (Kans.) Appeal. "LaGrange gravel is a variety which requires no binder. In some mysterious way it cements itself, the process being so rapid that it usually must be taken apart with a pick before it can be shoveled from the car in which it is shipped. The gravel is taken from the earth across the river from LaGrange, Mo."

Samples of gravel and sand recently discovered near a sand pit on the J. E. Putnam farm near Salina, Kans., have been returned from Manhattan where they were sent for analysis for highway purposes. The samples came back with an O. K. placed on them and the report that they would meet federal requirements for road purposes.

Jackson Gravel Co. is a comparatively new organization with a large gravel pit near Utica, Miss., from which to supply sand and gravel for the building needs of Jackson and vicinity.

A new sand and gravel company has been organized at Cape Girardeau, Mo. It will operate between Lutesville and Glenallen on Big Crooked creek.

It has been estimated that 105,080,000 lb. of sand and gravel is being hauled daily from the vicinity of Pacoima Wash, to be incorporated into the new skyscrapers that are rising in Los Angeles and vicinity. This vast tonnage of building material is being borne by an endless line of trucks that operate throughout the 24 hr. of the day. The number of loads transported each day is given as 4420, the material being loaded at the 16 crushing plants that are in operation along San Fernando boulevard or adjacent to it.

Quarries

Atlas Rock Co., which recently purchased the gravel plant near Oakdale, Calif., from the Turlock and Medesto irrigation districts, expects to double its capacity in February, when the new concern will begin turning out ballast material for the Southern Pacific railroad.

The railroad is preparing to re-ballast 90 miles of track on this division, and with the plant located on its lines will use the material from the Oakdale plant.

Southern Pacific Railway Co. is preparing to open the rock quarry at Miami, Ore., and soon it will have work trains in operation carting material from there to a point on its main line near Bar View. The rock is to be used to construct a sort of sea wall several hundred yards in length where the heavy seas during high tides and storms have always caused trouble in winter to the track bed. The quarry is owned by the Whitnew company, from whom the Southern Pacific obtained permission for its use.

Sunlight Crushed Stone Co., a subsidiary of the Sunlight Mining Co., Madisonville, Ky., is producing road-making, ballast and concreting rock, using by-product material of the mining company, which is a strip mine operating company. The mining company has two veins of coal, separated by a limestone parting of about the same width as the coal. It is necessary to drill and blast the rock after taking off the upper vein of coal. The rock blasted out from this parting is lifted by steam shovels, loaded to cars pulled by small locomotives, and carried to the stone crushing plant. In view of the fact that the stone has to be blown out to reach the coal, the crushing plant is really getting its stone at no cost but that of loading and transportation.

There has recently been discovered near Trap lake, near Dryden, Ont., a deposit of soapstone which has been reported upon by mining engineers and geologists as being of exceptional fine quality. Furthermore, the deposit is stated to be five times the size of any other deposit of its kind yet discovered in Canada. It is estimated that there is considerably over 1,000,000 cu. ft. of the material above the surface and that it will continue to as great a depth as it is possible to mine anything. Soapstone is used largely in the electrical industry for switchboards. It is also extensively used in place of ordinary fire brick to line furnaces and it has other uses. A company has been formed with a capital of $500,000 to acquire and develop this property.

John Wilson, of Rushville, Ill., has leased a 100-acre tract of land a mile and a half east of Plymouth to a company made up of men from Macomb, Galesburg and Chicago, who will open a stone quarry.

Santa Fe Railroad is planning to install a large rock crushing plant at Brownsville, Texas, to make ballast for the road, according to news dispatches from Fort Worth.

Greenville (Ark.) Stone and Gravel Co., has been sued for $35,000 on account of an accident. A steel cable broke and struck a man's leg, injuring him severely.

Topeka, Kan., has leased a stone quarry and will use it to furnish work for prisoners who have been sentenced for violating the state prohibitory law. The county will pay the quarry owners 10 cents a ton royalty and will use the rock for highway purposes.

West Duluth Crushing Plant Co., West Duluth, Minn., has had its plant damaged by fire.

A $2,000,000 deposit of marble has been discovered within a few miles of St. Louis, and forty men are at work clearing the face of the 45-foot layer near Rush Tower, Mo., where the recently incorporated Missouri Marble Quarries, Inc., has begun operations. George J. Breaker is the president and principal owner of the company, which has taken over the 197 acres of land on which marble was discovered by two geologists, Lester Bailey of Yale University, and H. A. Wheeler, local mining engineer.

Cement

The Marquette Cement Manufacturing Co. is erecting six new reinforced-concrete silos for cement storage at its plant at Cape Girardeau, Mo. The aggregate capacity of the silos is 125,000 bbl. and their approximate cost $100,000.

South Dakota State Cement Plant.—The contract for the construction of two additional buildings at the state cement plant at Rapid City has been let to Carlson & Snitkey, Sioux Falls contractors. They were awarded the contract from a field of six bidders. Construction of the two additional buildings, the rock crusher plant and coal grinding plant, will make the state project complete. It is expected to be in operation next summer. Carlson & Snitkey have completed the rest of the project except the main mill, where work is now in progress. The other buildings are for office, shop and warehouse, bag and bag cleaning, raw materials plant, and storage tanks.

Southwestern Portland Cement Co.'s plant near Fort Worth, Texas, is under construction and work is being pushed to completion. This is a 3000-bbl.-per-day plant. The same company has plants at El Paso, Texas, and in California. Those supervising the work at Fort Worth include: O. J. Binford, secretary and general superintendent; C. C. Merrill, vice-president; and R. H. Coghlan, chemical engineer.

Pacific Portland Cement Co.'s new plant at Redwood City, Calif., is to be built on Redwood creek and pile driving for the foundations of the first unit is now going on. About 4000 piles averaging 85 ft. long will be driven for this unit.

Trinity Portland Cement Co.'s plant at Dallas, Texas, has been damaged by fire to the extent of $25,000.

Lime

Salisbury Lime Co.'s plant and equipment at Salisbury, Md., was destroyed by fire recently. A traveling show which had gone into winter quarters in one of the company's warehouses was also burned.

The Trexler Lime and Supply Co. of Allentown, Pa., has taken in Stanley Innes, Victor Hillegass and Dr. C. C. Rogers as partners. The plant is to be enlarged and the output increased.

Rockland & Rockport Lime Corporation directors have declared an initial semi-annual dividend of 3 per cent on the second preferred stock and an initial quarterly dividend of 1½ per cent on the common stock, payable February 1.

Sonoma Co., Calif. Farm Bureau is to build a plant for the manufacture of lime sulphur, which is used in that section for spraying apple trees.

Virginian Consolidated Lime Co., R. E. Christian, secretary, of Staunton, Va., has under development 150 acres, present output 50 tons; Arnold & Weigle, cons. engr., Woodville, Va.

Northern Lime and Stone Co., of Petoskey, Mich., recently suffered considerable damage from fire.

Prof. R. Harcourt of the Ontario Agricultural College, Guelph, commenting on the soil tests of G. G. Bramhill, stated that the soils of Norfolk county need lime and that the farmers in that county should purchase limestone.

The Newcastle, Calif., Lime Co. has closed down until spring, after a successful run, according to announcement by Manager K. C. Bowman. Bowman, it is stated, is leaving for New York to look over conditions on the Atlantic Coast, and his plant will reopen in the spring prepared to do a business even larger than that of the 1923 season.

Central Lime and Cement Co., 131 North Homan avenue, Chicago, manufacturer of lime, cement-plaster and kindred products, has acquired property in the West Division section, totaling about 30,000 sq. ft., for an addition to its plant.

Silica Sand

W. R. Young has been appointed receiver for the Washington Silica Sand Co. of Brink Haven, Ohio, in connection with the suit of John G. Ryburn and Ella M. Ryburn against this company.

Columbia Silica Co., recently incorporated in Akron, Ohio, to manufacture sand blast sand, is building a plant near Akron. P. A. Snyder is president and J. E. Ruch, general manager.

Berkshire, Mass. Glass Sand Co. is puttting up a new dryer building.

Crescent Silica Co., which has a plant at Ottawa, Ill., is issuing 7 per cent first mortgage bonds to finance its new plant.

Agstone

Oregon farmers have been shipped 210 carloads of agricultural lime from the state plant. The state lime plant has already more than justified the wisdom and foresight of those who fought for its establishment, declares Sam H. Moore, chairman of the lime board. The educational value of such a wide distribution of lime is enabling farmers in so many parts of the state to demonstrate the value of lime on their farms has more than repaid the state for all expenditures in its behalf.

A special rate of 9½ cents on crushed limestone moving from Portland to Veronia, N. Y., has been made by the S. P. & S. system, according to announcement made by W. D. Skinner, vice-president. This rate will permit farmers in the Nehalem valley to obtain this fertilizer at a reasonable rate. The rate formerly was in effect from Portland to Astoria, but the Nehalem valley farmers found it difficult and costly to haul the product from that point.

Concrete Products

Port Newark Brick Co., recently organized, headed by William Decker, 118 Clinton avenue, Newark, N. J., will commence the construction of its proposed local plant on tract of 2½ acres of land leased from the city at Port Newark, for the manufacture of sand-cement brick. A portion of the works will be given over to the production of cement color brick. The initial plant will cost approximately $250,000, including machinery.

The Duntile Co., Ltd., have erected a plant on Clanranald avenue, Montreal, to make concrete building tile and have opened a sales office at 499 Phillips square. Duntile is made by molding plastic concrete under pressure in special machinery. It is steam cured. Glazed Duntile is made in various colors, the glazing being done by applying portland cement by heavy air pressure.

F. Leslie, 718 Somerset street, West, Ottawa, Ont., is in the market for equipment for cement blocks.

Knightsville Cement Block Co., of Providence, R. I., lost one of its buildings recently by fire.

The Cement Products Co., Inc., of Tacoma, Wash., will start production of cement sewer pipe, building blocks, tile, septic tanks and concrete specialties about March 1.

The Helm-Lewis Cement Block Co. of Indianapolis is producing 3,600 blocks per day and expects to have 125,000 ready when the season opens.

The Florence Artificial Stone Co. has been incorporated in New London, Conn. The incorporators are Betista Bottenelli, 22 Reed street, Louis Gropelli and Giorgi Cesare, of New London. The capital stock is $50,000, divided into 500 shares at $100 each.

R. de Montigny, 1396 St. Dominique street, Montreal, is equipping a plant for the manufacture of cement blocks.

Los Angeles Concrete Tile Co., I. W. Hellman building, Los Angeles, Calif., contemplates erection of two factory buildings on the four-acre industrial site it recently purchased at the corner of Mission road and Fremont avenue, Alhambra, Calif. The main building will be 70x200 ft., and curing shed 70x150 ft.

Southern Cement Products Co., San Antonio, Texas, of which Harvey Perrin, 521 Menchaca, is manager, will erect a 60x80 ft. concrete factory building in which it will manufacture cast stone.

Even & Brunen have acquired a site in Vero, Fla., and will establish a plant for the manufacture of concrete blocks, tile, brick and ornamental stone. The plant will be equipped with electrically driven machinery.

Magnesite

The American Minerals Co.'s plant at Valley, Calif., closed Dec. 1 for the winter, but will reopen about March 1.

Northwest Magnesite Co. at Chewelah, Wash., will continue to produce magnesite during the entire winter, according to R. B. Rogers, superintendent. The company is operating one kiln and shipping fifty tons a day of dead-burned magnesite. Sixty men are employed at the kiln and sixty at the plant.

A very interesting feature of the work of lining the San Fernando tunnel, one of the longest in the Southern Pacific Railroad Co.'s western system, was the way in which the concrete was mixed outside the tunnel and then blown by compressed air through a 6-inch wrought-iron pipe directly into the forms. The tunnel is 6,978 feet in length; and, as the work progressed, the concrete was delivered pneumatically a distance of 4,000 feet. The entire job of lining the tunnel called for an expenditure of over $1,000,000. The lining of the tunnel with concrete obviates fire hazard, and will do away with the necessity of slowing down the trains while they are passing through it.

According to word from Seattle, cement mills in central Washington will close only for small necessary repairs during the holiday period this year as demand warrants operations on a three-shift basis including Sundays and holidays. Most mills are trying to accumulate stocks and prices are firm at $2.75 a barrel at the mill.

Phosphate Rock

Idaho Phosphate Co. properties near Paris, Idaho, are now shipping phosphate.

Darling & Co., Inc., 4201 South Ashland avenue, Chicago, manufacturers of fertilizer products, has preliminary plans in progress for the erection of a new pant at 44th street and Racine avenue, to cost about $350,000, with equipment, replacing its former works at this location, recently destroyed by fire. S. J. Riley, company address, is architect. C. A. Alling is president.

Baltimore producers of fertilizer are predicting a heavier demand and an increased price in 1924.

Plough Chemical Co., Memphis, Tenn., has tentative plans for a new fertilizer works, including laboratory, machine shop, box factory and other departments, to cost about $400,000 with machinery. The project will mature early in January. Abraham Plough is president.

Talc

Blue Ridge Talc Co. is just starting the construction of additional warehouse space which when completed will add 80 per cent storage capacity for finished materials. This is the second addition to be constructed this year. Early in the year it was found necessary to increase both finished and raw storage space due to increased production, largely in the paint pigment and mortar color departments. The plant is at Henry, Va.

Slate

Stasco Milling Co., care of the Industrial Bureau, Board of Trade, Baltimore, said to be affiliated with the Stasco Laminated Slate Co., Poultney, Vt., has purchased property at Whiteford near Baltimore, and will commence the erection of a plant for the production of roofing slate, estimated to cost $250,000 with machinery. It will include a power house and machine shop.

Gypsum

A. C. Beard Plaster Co., Kansas City, Mo., has moved from 207A Shiedley building to 920 A. & R. building.

Sand-Lime Brick

Hinde Bros. are erecting a sand-lime brick plant at the corner of Spears and Northland avenues, Toronto. They purchased the plant of Schultz Bros., Brantford, which has been removed to Toronto. Hinde Bros. formerly made clay brick, but as the clay has run out and as they have large quantities of sand suitable for the manufacture of a high grade sand-lime brick, they are installing the sand-lime plant.

Trade Literature

The Mack Buldog is an exceptionally handsome pamphlet issued by the Mack Int. Truck Corp.

Pulverized Coal for Boilers, Fuller-Lehigh Equipment and Fuller News are three pamphlets just issued by the Fuller-Lehigh Co., describing the latest methods of using pulverized coal and the Fuller-Kenyon conveying system.

Pulverburner, issued by the K-B Pulverizer Corp., is a bulletin describing the mechanical unit of this company's system of burning powdered coal.

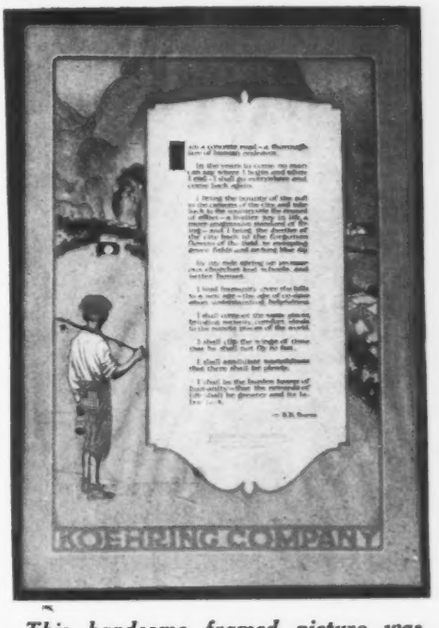
Northwest Engineering Co. is sending out a bulletin in letter form with a number of pictures illustrating uses of its crawler crane.

Filler Presses, Pumps and Mixers is the title of a catalog issued by the John Johnson Corp., describing its machines.

The Telsmith Co. has issued two handsome pamphlets, one on Telsmith crusher and the other on the same company's mining, quarry and gravel pit machinery.

Erie Steam Shovel Co. has put out a leaflet which gives the good points of its shovels.

Sullivan Machinery Co. is sending out three excellent bulletins entitled DW-64 Water Jet Drifting Drills, Sullivan Gasoline Engine Driven Air Compressors and Improvements in Angle Compound Compressor, each describing the machine named.



This handsome framed picture was sent out to those interested in highway building

Report on Property of the Mammoth Plaster and Cement Company

W. P. PAYNE, manager of the Jumbo Plaster and Cement Co., of Sigurd, on his recent visit to this city, examined samples from many parts of the Coal creek gypsum deposits and after spending considerable time looking over the local situation, gave an encouraging report to the directors and some of the large stockholders of the Mammoth Plaster and Cement Co. Fifteen years of experience with both the manufacturing and marketing ends of the business enables Mr. Payne to draw valuable conclusions.

Mr. Payne says: "The plaster business is in its infancy. Your company cannot injure the Jumbo, for the market is unlimited. On a recent trip to the coast I brought back one order alone for 100 carloads of plaster.

"While going over the deposits today I took many surface and underground samples, each of which shows an excellent quality of gypsum. It is costing some plaster companies $4 to $5 a ton to quarry and deliver the raw gypsum to the mill. It will cost your company not to exceed 25 or 30 cents. Your power should not cost you in excess of 40 to 50 cents per ton. Your cheap coal will be an advantage to you. You should be able to put your plaster on board the cars at a great saving over the cost to other companies."—*Salt Lake City Tribune.*

A later note in the same newspaper states:

Keen interest is being shown in the investigations of the coast cement market made by Dr. M. J. Macfarlane and G. H. Lunt, and the plans of the Mammoth Plaster and Cement Co. to exploit this market. Dr. Macfarlane stated at a recent stockholders' meeting of the corporation that there was an unlimited demand for plaster in Los Angeles and that one company offered to contract for 500 tons of raw material per day.

The tremendous building program of Los Angeles for the next two years is likely to increase rather than diminish, he said, judging from indications, and a steady market for plaster is thus assured. Taking the present price of plaster in Los Angeles as a basis ($14.30 per ton), the company estimates that it can ship plaster to Los Angeles at a profit of $5.05 per ton.

The analyses of two samples of local gypsum by the Western Precipitation Co., Raymond J. Kister, chemist, are as follows:

Acid insoluble, No. 1 0.36 per cent, No. 2 0.26 per cent; iron and aluminum oxides, No. 1 0.38 per cent, No. 2 0.20 per cent; calcium oxide, No. 1 32.66 per cent, No. 2 33 per cent; magnesium oxide, No. 1 trace, No. 2 trace; sulphur trioxide, No. 1 45.38 per cent, No. 2 45.80 per cent; carbon dioxide, No. 1 trace, No. 2 trace; water, No. 1 20.52 per cent, No. 2 20.50 per cent.

Both of these samples, the chemist explained, burn to good plaster, white in color, with a consistency of about 63 and a sand-carrying capacity 2 to 2.5. No. 2 sets slightly harder than No. 1.

S. Paul Window of the Western Precipitation Co. wrote that one of the largest plaster companies in Los Angeles is operating on a margin of $1.50 clear profit per ton of plaster, so that the local company feels sure of a handsome profit.

The company, according to Dr. Macfarlane, estimates that the machinery and plant will cost $55,000 and that $100,000 will be needed to properly finance the proposition.

Heavy Market Predicted for Glass Sands

IT is reported by *Chemical and Metallurgical Engineering* that at least $18,000,000 are to be invested in new glass plants in 1924. The largest new plant will probably be that of the National Plate Glass Co., a division of General Motors, which makes glass for automobiles. One unit of its new plant at Ottawa, Ill., is already under construction and the same company is building a new plant at Blair, Pa.

The Libbey-Owens Sheet Glass Co. is putting up one unit of a new plant near Toledo, Ohio. At Clarksburg, Va., the Clarksburg Glass Co. is remodeling and improving its plant. The Wheeling Glass Manufacturing Co., at Wheeling, W. Va., is making a lot of extensions and improvements on its plant which has been shut down for two years. The Westmoreland Specialty Glass Co., Jeannette, Pa., is to double its plant capacity at once. The Weston Glass Co., at Weston, W. Va., is making extensive repairs and alterations and the Sneath Glass Co., Hartford City, Ind., is doing the same.

All this promises to add considerably to the present market for glass sand. In the refractories the demand is expected to be quite as heavy as in the past year and the same is true of the minor uses of silica.

New Fertilizer Which Uses Raw Phosphate Rock

GEORGES CLAUDE, a French chemist and investigator, has been working on a new fertilizer which will contain the necessary elements, but which uses rock phosphate in the raw form instead of the usual superphosphate.

His process, described at a Congress of Chemistry, held in Paris recently, consists of combining synthetic ammonia (made from the air) with sylvanite from the Alsatian potash mines. In this way a soluble potassium-ammonium chloride is formed. This is combined with a raw rock phosphate reduced to an impalpable powder and collected by the Cottrell electric process.

How Slag Brick Is Made in England

A PLANT recently started in England for making slag brick is said to be quite successful. The slag used in making slag brick is first granulated. This is done by water but because of the high moisture content of the granulated slag (40 to 50 per cent), the cost of drying was found to be prohibitive, being as much as $1.50 per thousand brick made. The difficulty has been nicely overcome by means of an adjustable trough for regulating the length of time that the slag is in the stream of water before the mixture is fed to an inclined rotating trammel which de-waters it while there is still enough heat in the slag to almost dry the granules. This adjustment is varied depending on the quality and temperature of the molten slag. By this "knack" the moisture content is reduced to about 8 per cent on completely granulated slag, but it is found more desirable to obtain a totally dry slag and stop just short of complete granulation. Reduction is completed in rolls. Measurement of the granulated slag and slaked lime in the proportion of 12 lime to 88 slag is carried out mechanically. The mix is weighed and tempered in a mixing mill. A 200-lb. press forms the blocks which are then wheeled to the hardening tunnels. Hardening is accomplished by steaming at atmospheric pressure for five or six hours. Remarkably uniform brick are supplied with a porosity of between 7 and 8 per cent and a crushing load up to 200 lb. per square foot. Immediately after steaming, the brick are ready for shipment but are allowed to weather in the open for about two months. Experiments are being made with coloring the brick. An output of 36,000 brick in 24 hr. is the rating of the plant.—*Iron Age.*

Virginia Will Store Highway Materials

FOLLOWING the example of many other states, Virginia will store highway building materials and makes the following offer to contractors:

The state will pay the freight on shipments of sand, stone and gravel to be stored for use in times of car shortage and in addition will pay 65 per cent of the value of these materials provided the materials are placed on rights of way and, if located on private property, the owners of the property allow the department access to the materials.

It is understood, according to the proposed agreements, that the contractors will not use the materials in question except for the emergency purposes for which they are stored.

It is believed that the plan will greatly facilitate road construction in Virginia, especially as it follows on the heels of the department's policy of furnishing cement for construction.